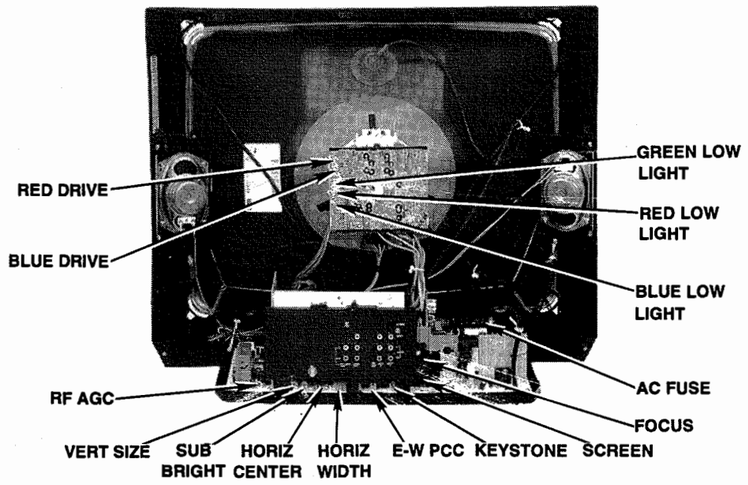
CABINET - REAR VIEW



TEST JIG HOOKUP

Function	Chek-A-Color Adapter No.	PC Board Plug No.	Pin	Color
CRT	B239	DY	1	Red
Yoke	D4157		2	Green
Yoke Setting	YP1A		3	Blue
Comments	Focus Tap		4	Yellow

The listing of any available replacement part herein in no case constitutes a recommendation, warranty, or guarantee by Howard W. Sams & Company as to the quality and suitability of such replacement part. The numbers of the listed parts have been compiled from information furnished to Howard W. Sams & Company by the manufacturers of the specific type of replacement part listed.

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PHOTOFACT® Technical Service Data

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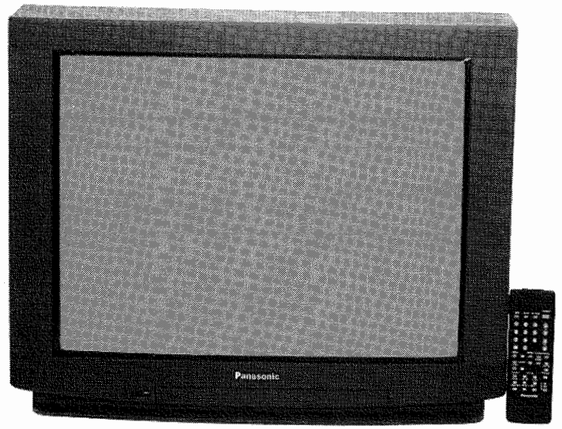
For Supplier Address, See PHOTOFACT Annual Index

PANASONIC
Model CTP-2780SF (Chassis AEDP218)



Complete coverage for servicing a television receiver...

- **Schematics**
- **Parts lists**
- **Component locations**
- **Troubleshooting guide**

Coverage includes these additional models and chassis:

MODEL	CHASSIS
CT-F29L1	AEDP218
CT-F29L1L	AEDP218
PC-29SF80A	YAED218

HOWARD W. SAMS & COMPANY

SEPTEMBER 1993 SET 3203

3203

SAFETY PRECAUTIONS

SERVICE WARNING

ONLY qualified service technicians who are familiar with safety checks and guidelines should perform service work. For continued SAFETY:

1. Before replacing parts, disconnect power source to protect electrostatically sensitive parts.
2. Do not attempt to modify any circuit unless so recommended by the manufacturer.
3. When servicing chassis, use an isolation transformer between the line cord and power receptacle.

SERVICING HIGH VOLTAGE AND PICTURE TUBE

Use EXTREME CAUTION when servicing the High Voltage circuits.

1. To discharge static High Voltage, connect a 10 kilohm resistor in series with a test lead between chassis and picture tube anode lead.
2. DO NOT lift picture tube by the neck.
3. ALWAYS wear shatterproof goggles when handling picture tube to protect eyes in case of implosion.

X-RAY RADIATION AND HIGH VOLTAGE LIMITS

Be aware of the instructions and procedures covering x-ray radiation. In solid-state receivers and monitors, the picture tube is the only potential source of x-rays.

1. Keep an accurate High Voltage meter available at all times. Check meter calibration periodically.
2. Whenever servicing a chassis, check High Voltage at various brightness levels to be sure it is regulating properly.
3. Keep High Voltage at rated value, NO HIGHER. Excessive High Voltage may cause x-ray radiation or failure of associated components. DO NOT depend on protection circuits to keep voltage at rated value.
4. When troubleshooting a set with excessive High Voltage, avoid close contact with picture tube. DO NOT operate set longer than necessary. To locate the cause of excessive High Voltage, use a variable AC transformer to regulate voltage.
5. In present chassis, many electrical and mechanical components have safety-related characteristics which are not detectable by visual inspection. Such components are identified by a # on both the schematic and the parts list. For SAFETY, use only equivalent replacement parts when replacing these components.

SAFETY CHECKS -- FIRE AND SHOCK HAZARD

Cold Leakage Checks for Sets with Isolated Ground

1. Unplug the AC cord, connect a jumper across the plug prongs, and turn the power switch ON.
2. Use an ohmmeter to measure the resistance between the jumpered AC plug and any exposed metal cabinet parts such as antenna screw heads, control shafts, or handle brackets. Exposed metal parts with a return path should measure between 200 kilohms and 5 megohms. Parts without a return path must register infinity.

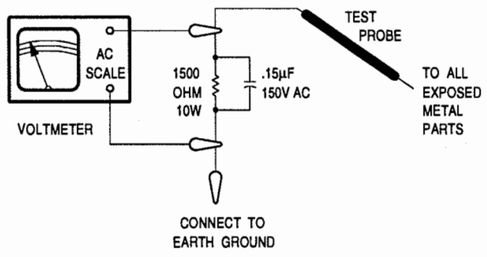
Hot Leakage Current Check

1. Plug the AC cord directly into AC outlet. DO NOT use an isolation transformer.
2. Use a 1500-ohm, 10-watt resistor in parallel with a .15-microfarad 150 Volts AC capacitor to connect between any exposed metal parts on the set and a good earth ground. (See figure below.)
3. Use an AC voltmeter with at least 1000 ohms-per-volt sensitivity to measure the voltage across the resistor. Check all exposed metal parts and measure voltage at each point.
4. Voltage readings should not exceed .75 volts RMS (5 milliamps AC). Any value exceeding this limit constitutes a potential shock hazard and must be corrected.
5. If AC plug is not polarized, reverse the AC plug and repeat exposed metal part voltage measurement at each point.

GENERAL GUIDELINES

Perform a final SAFETY CHECK before returning set to customer.

1. Check repaired area for poorly soldered or de-soldered connections, and check entire circuit board for solder splashes.
2. Check inner board wiring for pinched wires or wires contacting any high-wattage resistors.
3. Check that all control knobs, shields, covers, grounds and mounting hardware have been replaced. Be sure to replace all insulators and restore proper lead dress.



TROUBLESHOOTING

POWER SUPPLY

Check the AC fuse F001. If Fuse is open:

Check T001, D801 thru D804, and C801 thru C803, C805 and C806.

Check for 5.0V at the emitter of Q017. If 5.0V is missing:

Check T001, D001, C006, C008, and Q017 .

Apply 120V AC and check for 160V* at the cathode of D802. If 160V* is missing:

Check L801 and RL001.

If 160V* is present at the cathode of D802, check for 141V at cathode of D811.

If this voltage is missing:

Check D811, T801, and IC801.

If the proper voltage is present at D811:

Refer to the "Horizontal" section of this Troubleshooting guide.

* With respect to isolated ground.

AUDIO

Select an active TV channel and check for an audio waveform at pin 28 of IC101. If the waveform is missing or improper:

Check pins 25, 28, 29, and 30, of IC101.

If waveform is present, select a station transmitting a signal in stereo and check for an audio waveform at pins 17 and 18 of IC2200.

If waveforms are missing:

Check IC2200.

If waveforms are present:

Check IC2301, IC2303, and IC3001.

VIDEO

Inject a video signal at base of Q101 and check for video on the CRT. If video is present:

Refer to the "IF-AGC" section of this Troubleshooting guide.

If there is no video on the CRT, check for a luminance waveform at pin 19 IC3001. If the waveform is missing:

Check IC3001, Q3001, Q101, Q3005, Q6501, and Q6503.

Check for luminance at pin 46 of IC301. If waveform is missing:

Check Q301, IC3001, Q3001, Q3271, Q3251, Q3523, Q3254, and Q3252.

If the brightness is inadequate or cannot be controlled:

Check pin 44 of IC301.

IF-AGC

Inject a video IF signal at the IF input and check for video on the CRT. If video is present:

Check the tuner, tuner control, and tuner AFC circuits.

If there is no video on the CRT, check for a video waveform at pin 11 of IC101. If video is present:

Refer to the "Video" section of this Troubleshooting guide.

If there is no video at pin 11 of IC101, apply AGC bias to pin 16 of IC101.

If video is now present :

Check pins 15, 16, and 17 of IC101.

If there is still no video :

Check IC101.

A defective AGC circuit can cause overloaded picture, excessive snow or loss of video.

See the AGC Voltage Chart for AGC voltages with signal.

AGC VOLTAGE CHART
IC101
Pin 16 2.9V
Pin 17 3.9V

CHROMA

Check for a chroma waveform at pin 20 of IC301. If waveform is missing:

Check Q6502, Q6504, and L6501.

Check for a chroma waveform at pin 42 of IC301. If the waveform is missing:

Check Q3006 and Q3007.

Check for the proper waveforms at pins 24, 25, and 26 of IC301. If these waveforms are missing:

Check pins 34, 42, and 49 of IC301.

If the proper waveforms are present at pins 24, 25, and 26 of IC301:

Refer to the "Raster" section of this Troubleshooting guide.

VERTICAL

Inject a vertical signal at pin 2 of IC451.

If vertical deflection is present:

Check pins 9, 10, and 11 of IC301.

If there is still no vertical deflection:

Check IC451 and deflection yoke.

Vertical linearity or height problems may be caused by vertical feedback, pincushion, and bias circuits, check C451 thru C455 and Q751 thru Q753.

TROUBLESHOOTING continued

HORIZONTAL

If the TV is not in shutdown, inject a horizontal signal at the base of Q551.

If horizontal deflection is now present:

Check Q501, T501, and IC301.

If there is still no horizontal deflection:

Check Q551, T551, D551, D552, and D554.

Horizontal linearity or width problems may be caused by C554 thru C556 and L551 being defective.

RASTER

Check the CRT and CRT voltages. If there is no red:

Check pin 26 of IC301, Q351, and Q354.

If there is no blue:

Check 24 of IC301, Q352, and Q355.

If there is no green:

Check 25 of IC301, Q353, and Q356.

If raster has height or width problems:

Refer to the "Vertical", "Horizontal", and "Power Supply" sections of this Troubleshooting guide.

HORIZONTAL OSCILLATOR DISABLE TEST

Apply 120VAC, turn the set on, tune in a picture, and normalize video. Connect high voltage meter to anode of CRT. Connect a variable DC bias to TPP4, and slowly increase voltage until set loses horizontal sync.

Observe high voltage meter it should read less than 36.4 KV. If picture does not lose horizontal sync, or high voltage is not less than 36.4KV, the shutdown circuit should be repaired. To resume normal operation, remove the DC bias.

STEREO ADJUSTMENTS

All adjustments were made using an MTS TV/Stereo generator connected to the antenna terminals, with the customer controls set to normal listening levels. Select stereo mode on TV.

INPUT LEVEL

On generator select pilot, 1kHz audio frequency, and L-R modulating signal. Connect an oscilloscope to TPE1. Adjust input level control R2200 for 900mVp-p.

L-R LEVEL

On generator select pilot, 1kHz audio frequency, and L-R modulating signal. Connect an oscilloscope to TPE11. Adjust L-R level control R2209 for 600mVp-p.

VCO

On generator select pilot, 1kHz audio frequency, and L-R modulating signal. Set volume for an audible signal. Set VCO control R2220 fully counterclockwise. Adjust VCO control clockwise until a clear signal is heard.

FILTER

Select SAP mode on the receiver. On generator select SAP, 1kHz audio frequency and L-R modulating signal. Connect an oscilloscope to IC2200, pin 21. Adjust filter control R2221 for minimum.

SEPARATION

On generator select pilot, 8kHz audio frequency and left modulating signal. Connect an oscilloscope to TPE10. Adjust separation control R2213 for minimum amplitude of waveform.

MISCELLANEOUS ADJUSTMENTS

PRETUNING

NOTE: All procedures require an antenna connected and power applied to the set. Select TV/CATV Switch setting.

Auto Memory

1. Press the menu button to display the main menu.
2. Press the advance up or down button to highlight setup.
3. Press the advance left or right button to display setup menu.
4. Press the advance up or down button to highlight autoprogram.
5. Press the advance right button to start auto programming.

Manual Channel Programming

1. Press the menu button to display the main menu.
2. Press the advance up or down button to highlight setup.
3. Press the advance left or right button to display setup menu.
4. Press the advance up or down button to highlight manual program.
5. Press the advance left or right button to display manual programming menu.
6. Use the numeric keypad to select the channel to be added or deleted.
7. Press the advance right button to add the present channel.
8. Press the advance left button to erase the present channel.
9. Repeat steps 6 through 8 to add or delete other channels.

Clock

NOTE: Clock must be set to operate the dual timer feature.

1. Press the menu button to display main menu.
2. Press the advance up or down button to highlight setup.
3. Press the advance left or right button to display setup menu.
4. Press the advance up or down button to highlight hours.
5. Press the advance left or right button to set the hours, including AM / PM indicator.
6. Press the advance down button to highlight minutes.
7. Press the advance left or right button to set minutes.
8. Press the menu button to exit.

Day of the Week

NOTE: Day of the week must be set to operate dual timer feature.

1. Press the menu button to display main menu.
2. Press the advance up or down button to highlight setup.
3. Press the advance left or right button to display setup menu.
4. Press the advance up or down button to highlight setup.
5. Press the advance left or right button to select day of the week.

Dual On / Off Timer Setting

NOTE: The clock and day of the week must be set to use this function.

1. Press the menu button to display main menu.
2. Press the advance up or down button to highlight advanced features.
3. Press the advance left or right button to display advanced features menu.
4. Press the advance up or down button to highlight program timer.
5. Press the advance left or right button to display dual program timer menu.
6. Press the advance left or right button to select day of the week or daily mode.
7. Press the advance down button to highlight on selection.
8. Press the advance left or right button to select desired turn on time.
9. Press the advance down button to highlight off selection.
10. Press the advance left or right button to select desired turn off time.
11. Press the advance down button to highlight channel selection.
12. Press the advance left or right button to select desired channel.
13. Press the advance down button to highlight set selection.
14. Press the advance left or right button to select yes or no to turn timer on or off.
15. Press the advance down button to set timer 2.
16. Repeat steps 6 through 14 to set timer 2.

Normalize

1. Press video or select audio adjust from main menu
2. Press norm button to reset audio or video to factory setting.

HIGH VOLTAGE CHECK

Tune in a picture. Connect a high voltage probe to CRT anode. High voltage should read 27.5KV to 29.

MISCELLANEOUS ADJUSTMENTS continued

RF AGC

Tune in a picture. Adjust RF AGC control R132 counterclockwise until snow appears in picture, then clockwise to a point just past where snow disappears.

VIDEO LEVEL

Note: Do not adjust det out control R115 unless moved or replaced. Tune in a colorbar pattern. Connect an oscilloscope to pin 11 of IC101 and adjust fo 1V p-p.

SUB BRIGHTNESS

Tune in a picture. Set brightness, picture and color controls to minimum. Adjust sub bright control R324 for just visible highlights. Set brightness, picture and color controls to maximum. Check for blooming and readjust if required.

SUB CONTRAST

NOTE: Do not make adjustments to sub contrast control R309 unless CRT, CRT board, or associated components are replaced. Perform sub brightness adjustment following this procedure.

Tune in a color bar pattern. Connect an oscilloscope to pin 25 of IC301. Adjust sub contrast control R309 for 4.9V±0.1Vp-p.

PINCUSHION

Tune in a crosshatch pattern. Set horizontal width control R757 to minimum, and horizontal center control R502 to midrange. Adjust E-W PCC control R756 for straightest vertical lines at the right and left sides of the screen. Adjust keystone control R712 so that the vertical lines are 90° from the horizontal lines. Perform horizontal width/centering adjustment.

HORIZONTAL WIDTH / CENTERING

Tune in a crosshatch pattern. Set horizontal width control R757 to minimum. Adjust horizontal center control R502 for best horizontal centering. Adjust horizontal width control R757 for proper horizontal width.

COMB FILTER

Tune in a color bar pattern. Connect oscillioscope to TP35 on CRT board. Set ref control R6512 fully clockwise. Adjust L6502 for minimum amplitude of burst signal. Readjust R6512 for minimum amplitude of burst signal.

REFERENCE GYRATOR

Perform this adjustment when replacing IC301. Select video 1 on TV. Connect an NTSC color bar to video 1 input. Set noise reduction to OFF. Connect a dual trace oscilloscope channel 1 to the emitter of Q301. Connect dual trace oscilloscope channel 2 to pin 25 of IC301. Invert channel 2 on the oscilloscope. Set oscilloscope controls to chop, 20uS/div, CH1 and CH2 amplitude for equal signal size. Superimpose channel 1 signal over channel 2 signal so that base lines are identical. Set delay time for 2uS. Expand display using 10X control. Adjust horizontal position to display a time difference section of the waveforms. Adjust reference gyrator control R315 for a time difference of 360 ±- 10 nS.

MPU REFERENCE OSCILLATOR

Tune in channel 13. Connect a frequency counter to TPS3. Set tuning system to TV/ANT. Adjust MPU reference oscillator trimmer capacitor C058 for 32,768.0Hz ±.1Hz.

SUB COLOR / SUB TINT

Tune in a color bar pattern. Normalize video. Connect an oscilloscope to the red cathode of the CRT. Adjust sub tint control R614 to balance the second and third bars of the waveform. Adjust sub color control R610 for 140V p-p.

COLOR TEMPERATURE

Tune in an active channel, and allow 10 minutes for CRT to warm up. Normalize video. Set auto color to off, color to minimum, red R354, blue R355, and green R356 low light controls to midrange, red R360, and blue R361 drive controls to midrange, screen to minimum. Connect a jumper from TPS8 to ground to obtain a service line. Connect an oscilloscope to TP35, set input for DC and note the 0V reference point. Adjust sub bright control R324 to place the video peak of the waveform at a 3.0V DC ± .05V level. Connect the oscilloscope to the green cathode of the CRT, still on the DC setting, note the 0V reference point. Adjust the green low light control R356 to place the baseline at 190V DC ± 2V level. Advance the screen control to produce a faint horizontal line. Adjust the two remaining low light controls for a white line. Remove the jumper from TPS8. Set brightness and picture to maximum. Adjust the drive controls for a warm white picture. Check tracking at high and low brightness, touch up as necessary for best picture. Perform sub brightness adjustment.

PURITY

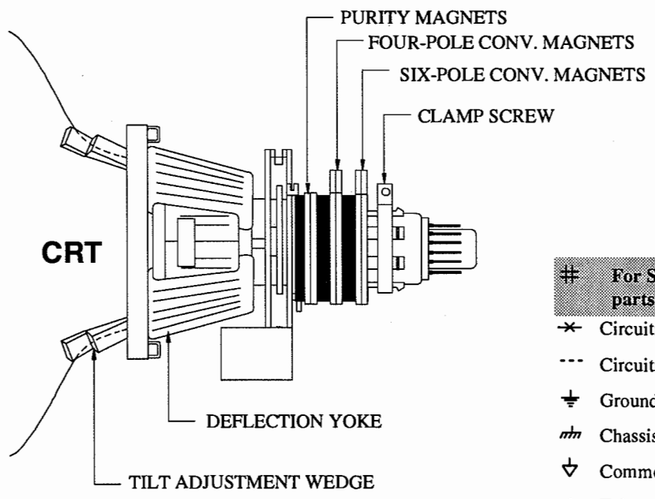
Operate the set for 60 minutes with the brightness control at maximum to allow CRT temperature to stabilize. Use a degaussing coil to demagnetize the CRT. Place a jumper between TP14 and ground. Turn red R360 and blue R361 drive controls to minimum to obtain a green screen. Loosen the deflection yoke and move it back as far as possible. Loosen locking ring and move the purity tabs to center the vertical green band. Slowly slide the deflection yoke forward until a uniform green screen is obtained.

MISCELLANEOUS ADJUSTMENTS continued

CONVERGENCE

Connect a signal generator to antenna terminals and tune in a dot pattern. Adjust 4-pole magnets to coverage the red and blue dots at the center of the screen. Adjust 6-pole magnets to converge the red/blue dots over the green dots at the center of the screen. Tune in a crosshatch pattern. Remove rubber wedges between the deflection yoke L555 and the CRT. Tilt deflection yoke up or down to converge the vertical lines at the top and bottom of the screen and the horizontal lines at the left and right sides of the screen. Tilt the deflection yoke left or right to converge the horizontal lines at the top and bottom of the screen and the vertical lines at the left and right sides of the screen. Repeat convergence procedure if necessary to obtain the best overall convergence. Replace rubber wedges. To obtain the best corner convergence it may be necessary to order the convergence corrector strip (part no. OFMK014ZZ). Place strip between CRT and yoke in area needing correction move and or rotate the magnetic strip untiI the best correction is obtained. Use tape in addition to the adhesive strip to secure it to the CRT.

CRT NECK ASSEMBLY



SCHEMATIC NOTES

For SAFETY use only equivalent replacement part, see parts list.

-x- Circuitry not used in some sets.

--- Circuitry used in some versions.

⏚ Ground

⏚ Chassis ground

▽ Common tie point

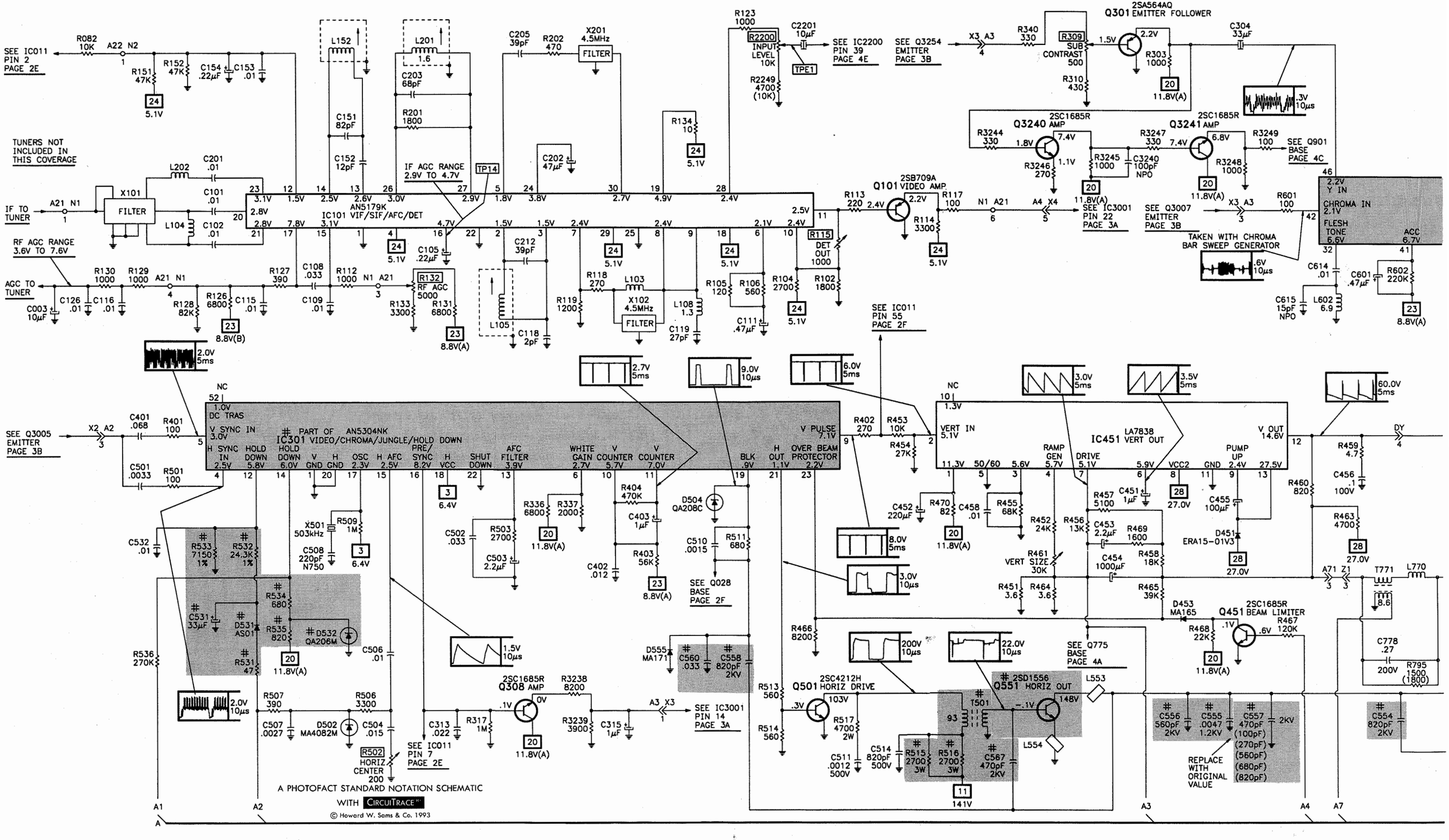
△ Taken from common tie point

11 Schematic Circuitrace

A Cabling: Heavy lines reduce use of mutiple lines.

Waveforms and voltages are taken from ground, unless noted otherwise.
Waveforms taken with triggered scope and keyed rainbow generator. Waveform voltage is peak to peak. Timebase is per division. Waveforms shown at 10 divisions.
Item numbers in rectangle appear in adjustment instructions.
Supply voltages maintained as seen at input.
Voltages measured with digital meter and no signal.
Controls adjusted for normal operation.
Capacitors are 50 volts or less, 5% or greater unless noted.
Electrolytic capacitors are 50 volts or less, 20% or greater unless noted.
Resistors are 1/2 W or less, 5% or greater unless noted.
Value in ( ) used in some versions.
Measurements with switching as shown, unless noted.
Rated voltage shown on Zener Diodes.

TELEVISION SCHEMATIC



A PHOTOFACT STANDARD NOTATION SCHEMATIC WITH CIRCUITRACE™

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TELEVISION SCHEMATIC continued

SEE IC011 PIN 41 PAGE 2G
SEE IC011 PIN 44 PAGE 2G
SEE IC011 PIN 43 PAGE 2G
SEE IC011 PIN 42 PAGE 2G
SEE IC011 PIN 21 PAGE 2F
SEE Q1192 COLLECTOR PAGE 3B
SEE Q1191 EMITTER PAGE 3B
X3 A3 8
R043 1800
R044 3900
R325 2200
R054 1800
R059 1200
R049 1800
R050 1200
R046 1800
R056 1200
R339 100
C322 2.2µF
R345 1000
R3237 10K
R328 33 1%
R331 1200
R330 1050 1%
R329 412 1%
20 11.8V(A)
R315 REF GYRATOR 10K
R316 2200
R326 1000
C302 .01
C318 1µF
R319 1M
27 0V YS
30 0V R
29 0V G
28 0V B
51 SHARPNESS 3.6V
45 WHITE EXPAND
38 3.3V BLOOMING
43 6.7V REF GYR
48 4.4V WHITE PEAK DET
OSD
PART OF AN5304NK
IC301 VIDEO/CHROMA/JUNGLE/HOLD DOWN
NC 7 .3V HIGH BRI START LEVEL
26 2.2V R
24 B 2.2V
25 G 2.2V
7.5V 10µs
R603 220
R605 220
R604 220
5.0V 10µs
A11 1 6
A11 2 4
A11 5
35 12V
33 GND
AIC ON/OFF 7.3V 31
APL DET .1V 50
CLAMP 1.8V 47
36 9V
TINT 2V 37
COLOR .7V 40
PICTURE/ SERVICE 4.3V 49
BLACK EXPAND 10.5V 39
BLACK DET 4.4V 2
WHITE SLICE 2V 3
3.58MHz 3.3V 34
HIGH BRI BRIGHT GAIN 1.7V 44 7.0V 8
20 11.8V(A)
23 8.8V(A)
SEE IC011 PIN 29 PAGE 3B
2SC1685R Q1102 AMP
2SC1685R Q1101 COLOR PILOT SWITCH
.7V .1V .1V 7.9V
R1124 10K
R1126 1000
D032 MA165
R608 15K
C611 .012
C316 4.7µF
R327 8200
R624 82K
C303 1µF
SEE IC011 PIN 25 PAGE 2F
R613 56K
R614 SUB TINT 50K
R615 82K
C613 .01
SEE IC011 PIN 26 PAGE 2F
D602 MA165
R626 16K
R627 7500
C602 .01
R610 SUB COLOR 50K
R612 82K
2SC1685R Q304 SWITCH
3.7V
C301 1µF
R349 12K
R301 1000
SEE IC011 PIN 23 PAGE 2F
TPS8
R332 150K
C317 4.7µF
R341 820
X601 3.58MHz
C603 7pF N750
C306 4.7µF
R305 1000
R334 10K
R3240 100
2SA564AQ Q305 HV DISCHARGE
1.7V 6.5V 5.9V
R3241 4700
D301 MA165
R302 1000
R324 SUB BRIGHT 20K
SEE IC011 PIN 24 PAGE 2F
D303 MA4062 L
C319 47µF
D1102 MA165
R1122 43K
R1123 56K
D1104 MA165
D1101 MA165
R1120 3900
R1121 6200
D1103 MA165
R1125 1000
23 8.8V(A)
12.0V 5ms
2SA564AQ Q604 AMP
D601 MA165
2SC1685Q Q603 AMP
R621 1000
R620 1000
2SC1685Q Q602 DYNAMIC COLOR
R617 8200
R623 150K
R622 18K
R618 1500
R616 12K
R609 27K
D1105 MA165
1000V 10µs
2SC1685Q Q3242 HV DISCHARGE
SEE Q001 COLLECTOR PAGE 2G
R3299 47K .1V
10.1V
R3250 4700
2 11.8V(B)
L555 YOKE
1.7
2700
2700
9.4
DY 1
DY 2
DY 3
R558 1000 1W
L551
MAGNET
Z1 4
A71 4
C559 .43 200V
R557 2700 2W
11 141V
D552 ERD07-15
C551 .01 1.2KV
L556
D553 RU3N
C552 .033 400V
R751 11K
R753 220K
2SC1685Q Q751 PARABOLA AMP
2.6V 8.0V 2.0V
C753 47µF
C754 470µF
R755 1000
27 28.0V
C751 .1
C752 .1
R752 110K
R765 39K
R754 10K
R756 E-W PCC 10K
R759 2700
2SA564AQ Q752 E-W PCC DRIVE
2SD1267AP Q753 E-W PCC DRIVE
9.7V .5V 10.3V
12.9V
R763 2700
R764 10 FUSIBLE 2W
R758 2200
R760 27K
R757 HORIZ WIDTH 5000
27 27.0V
SEE Q705 EMITTER PAGE 4B
R761 2200
R762 1000
5.0V 5ms
L751
R553 2.2 5W
C756 3.9µF 100V
11 141V
L551
10 HV ANODE 27.3KV TO 29.5KV
9 .5
1 .5
8 .2
6 FOCUS
SCREEN
5 .1
4
3
12 (11)
25 218V
SEE POWER SUPPLY PAGE 3H
SEE POWER SUPPLY PAGE 3H
SEE CRT FILAMENTS PAGE 2H
X
A72 8
C563 4.7µF 160V
2SC1685R Q302 ABL
R551 10K
R555 3000
R342 100
6.3V 2.6V
R320 20K
R344 10K
D556 MA165
R552 62K
R554 18K
D304 MA165
R343 10K
ADDITIONAL SCHEMATIC NOTES, SEE PAGE 1
A3 A7 A2 A5 A6 A1 A4 A
A PHOTOFACT STANDARD NOTATION SCHEMATIC WITH CIRCUITRACE™
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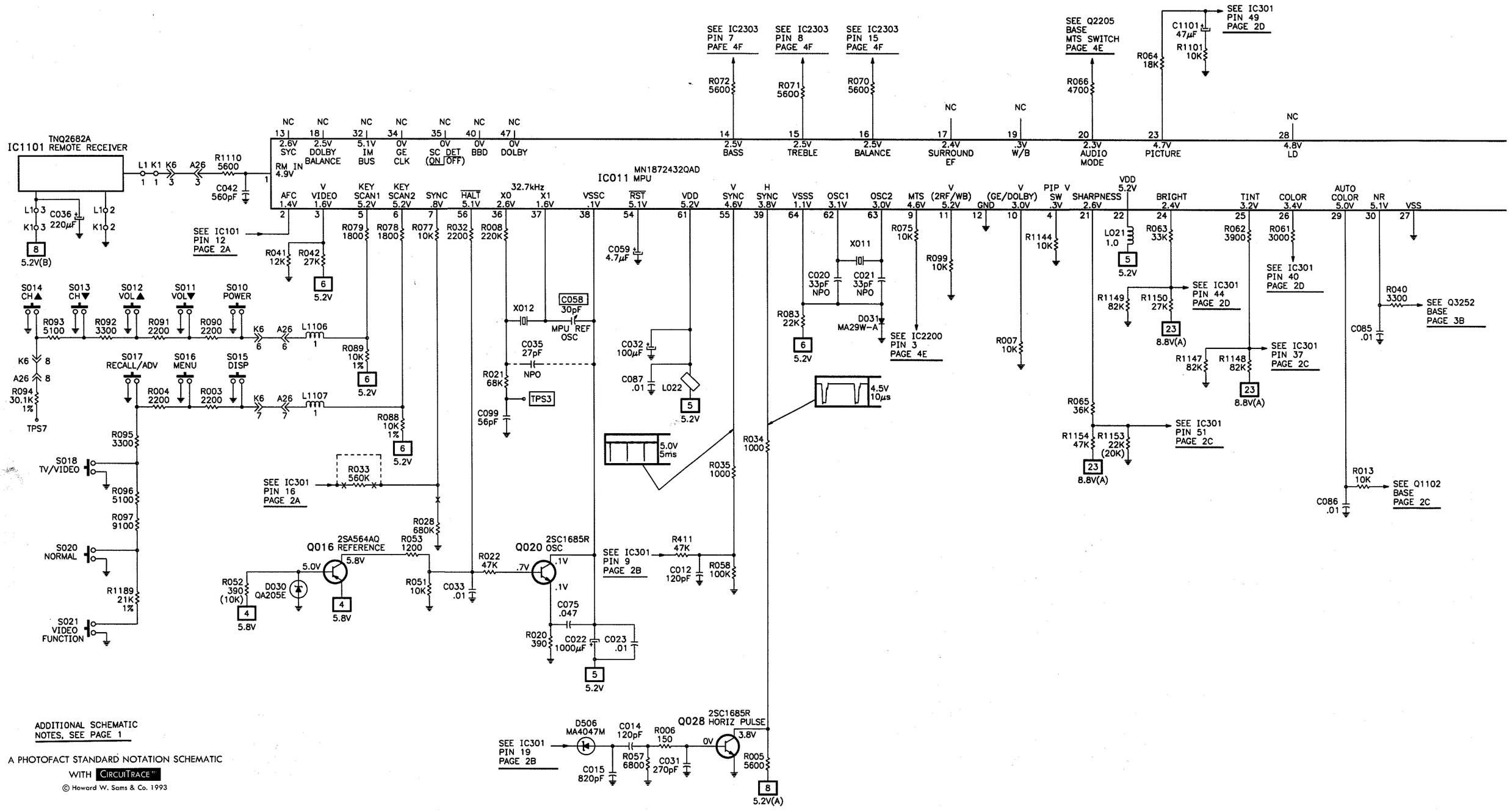
MPU SCHEMATIC


IC1101 TNQ2682A REMOTE RECEIVER
IC011 MN1872432QAD MPU
RM IN 4.9V
SEE IC101 PIN 12 PAGE 2A
SEE IC2303 PIN 7 PAFE 4F
SEE IC2303 PIN 8 PAGE 4F
SEE IC2303 PIN 15 PAGE 4F
SEE Q2205 BASE MTS SWITCH PAGE 4E
SEE IC301 PIN 49 PAGE 2D
SEE IC301 PIN 40 PAGE 2D
SEE IC301 PIN 44 PAGE 2D
SEE IC301 PIN 37 PAGE 2C
SEE IC301 PIN 51 PAGE 2C
SEE IC301 PIN 16 PAGE 2A
SEE IC301 PIN 9 PAGE 2B
SEE IC301 PIN 19 PAGE 2B
SEE IC2200 PIN 3 PAGE 4E
SEE Q3252 BASE PAGE 3B
SEE Q1102 BASE PAGE 2C
X011
X012
MPU REF OSC
Q016 2SA564AQ REFERENCE
Q020 2SC1685R OSC
Q028 2SC1685R HORIZ PULSE
D030 QA205E
D031 MA29W-A
D506 MA4047M
4.5V 10µs
5.0V 5ms
ADDITIONAL SCHEMATIC NOTES, SEE PAGE 1
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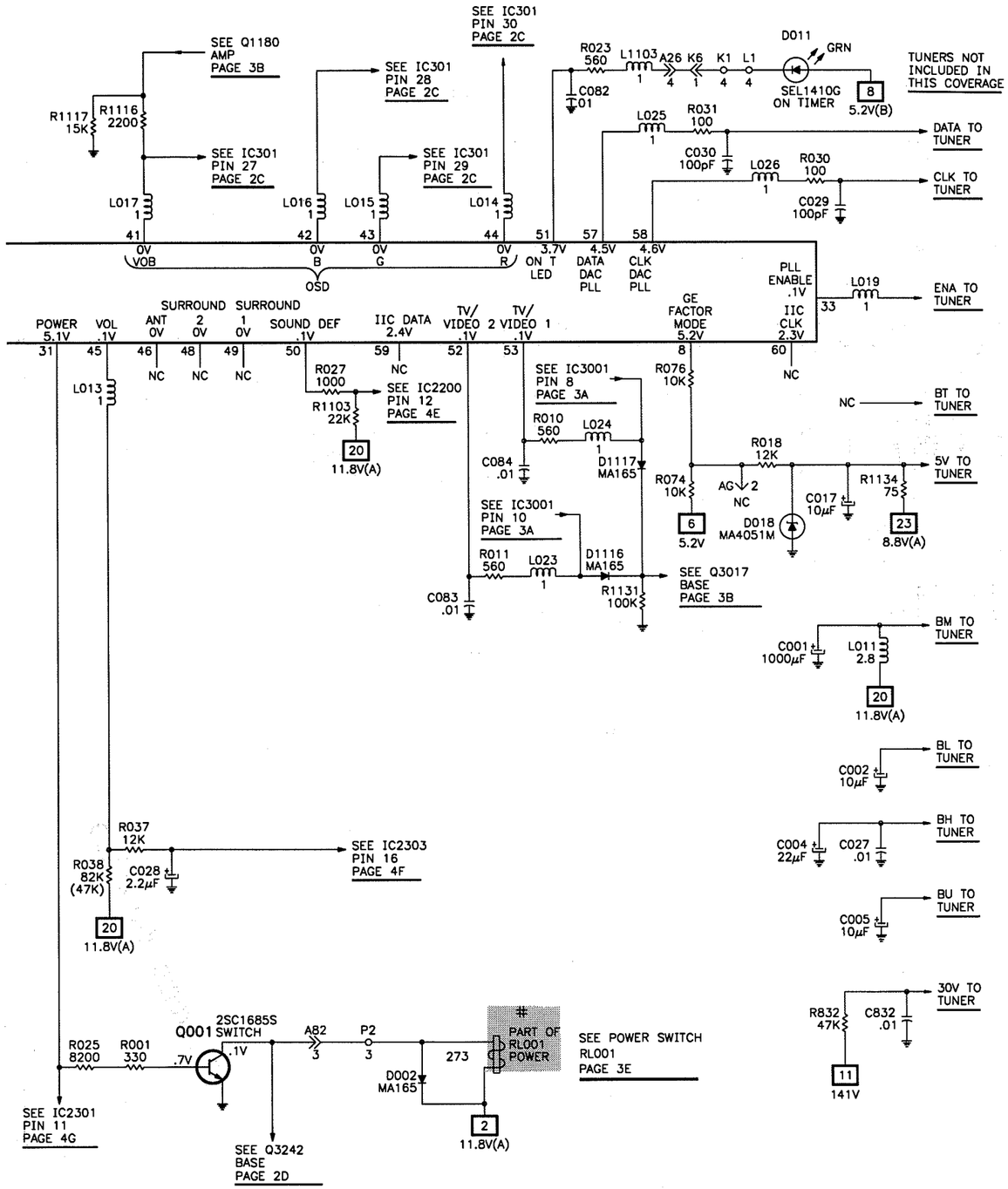
E

F

MPU SCHEMATIC continued



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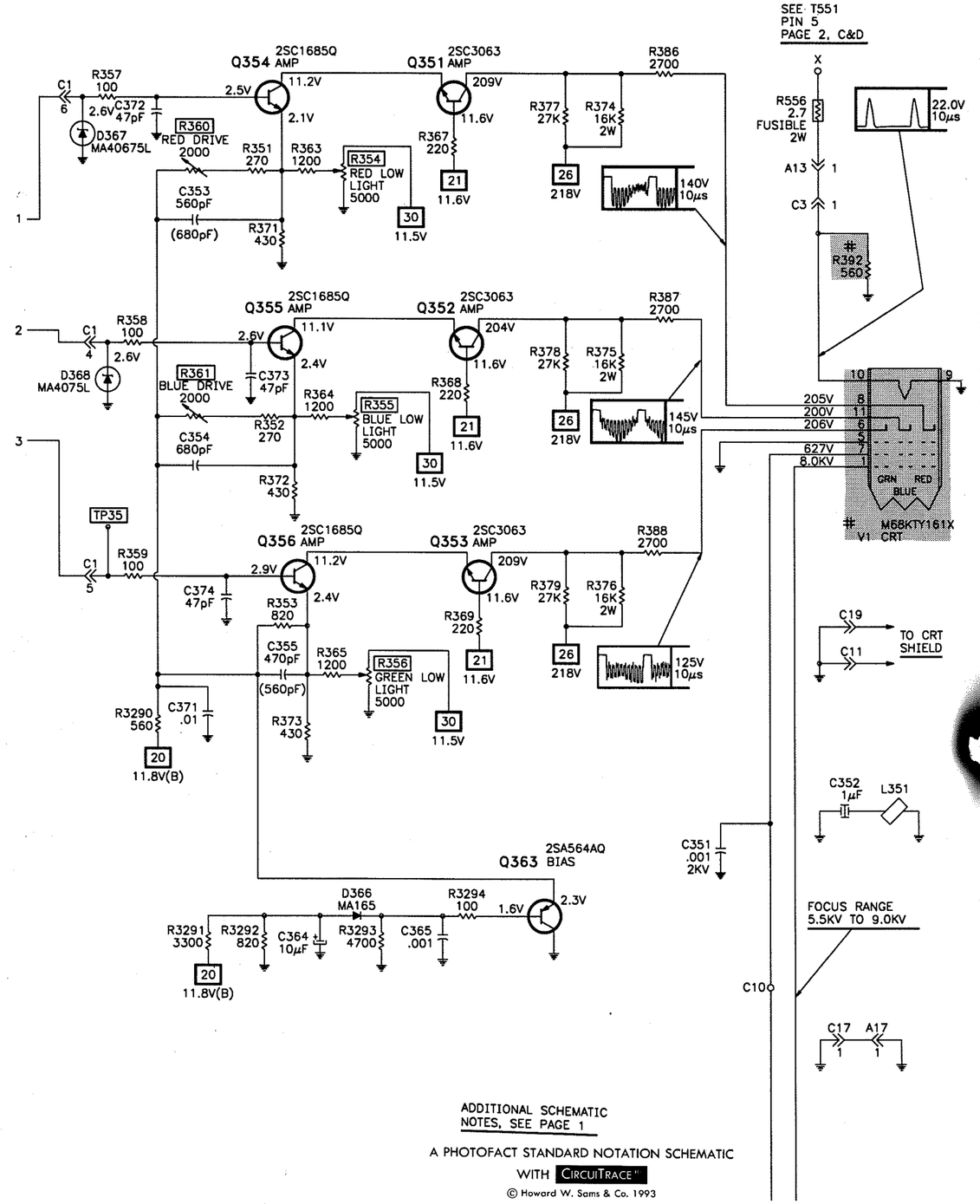
CRT SCHEMATIC



ADDITIONAL SCHEMATIC NOTES, SEE PAGE 1

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PANASONIC MODELS CTP-2780S (SIS AEDP218)

H

A

B

AUDIO/VIDEO/COMB FILTER SCHEMATIC

IC3001 AN5858K MAIN A/V CONTROL

SWITCH ACTUATED BY INSERTION OF PLUG INTO S-VIDEO JACK

AV1 CHROMA

PART OF JK3001 S-VIDEO IN

LUMINANCE PART OF JK3001 S-VIDEO IN

PART OF JK3001 S-VIDEO IN

PART OF AV1 JK3001 VIDEO

PART OF JK3001 AV1 AUDIO LEFT

PART OF JK3001 AV1 AUDIO RIGHT

PART OF JK3001 AV2 VIDEO

PART OF JK3001 AV2 AUDIO LEFT

PART OF JK3001 AV2 AUDIO RIGHT

SEE Q101 EMITTER PAGE 2B

SEE IC2200 PIN 18 PAGE 4G

SEE IC2200 PIN 17 PAGE 4G

SEE Q308 AMP EMITTER PAGE 2A

SEE IC011 PIN 30 PAGE 2F

SEE IC011 PIN 53 PAGE 2G

SEE IC011 PIN 52 PAGE 2G

SEE IC011 PIN 53 PAGE 2G

SEE IC011 PIN 41 PAGE 2G

SEE IC301 PIN 5 PAGE 2A

SEE IC301 PIN 42 PAGE 2B

SEE IC301 PIN 28 PAGE 2C

SEE IC301 PIN 27 PAGE 2C

SEE IC2303 PIN 1 PAGE 4F

SEE IC2303 PIN 22 PAGE 4F

SEE Q301 BASE PAGE 2B

SEE Q904 AMP PAGE 4C

PART OF JK3001 AV PROGRAM OUT VIDEO

PART OF JK3001 AV PROGRAM OUT LEFT AUDIO

PART OF JK3001 AV PROGRAM OUT RIGHT AUDIO

(4) TAKEN USING A STANDARD VTR 1V P-P VIDEO INPUT

ADDITIONAL SCHEMATIC NOTES, SEE PAGE 1

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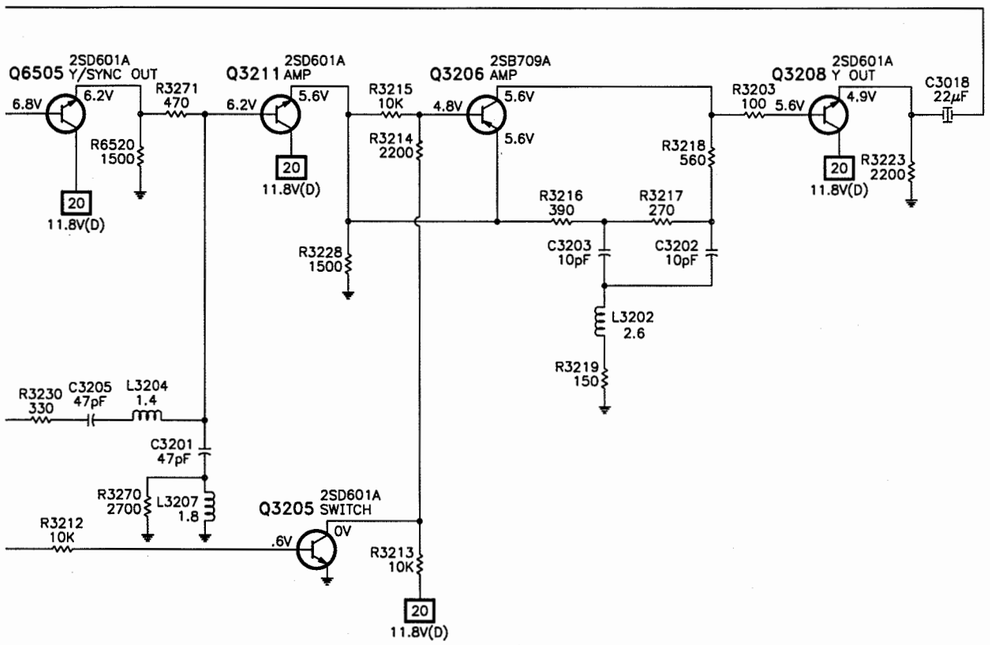
C
AUDIO/VIDEO/COMB FILTER SCHEMATIC continued



ADDITIONAL SCHEMATIC NOTES, SEE PAGE 1

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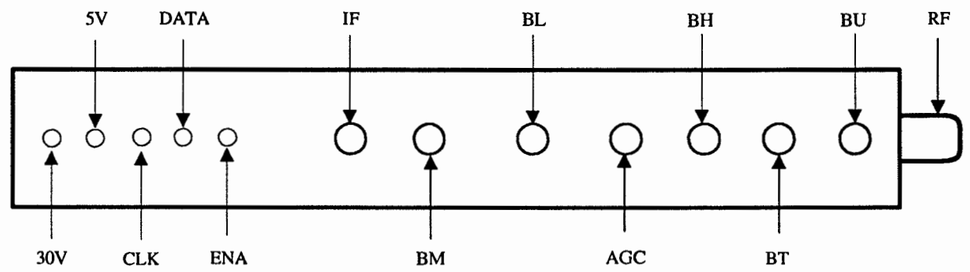
TUNER INFORMATION

TUNER VOLTAGE CHART

Pin	VHF Low Band	VHF High Band	UHF Band
30V	4.1V	7.3V	8.0V
5V	5.2V	5.2V	5.2V
CLK	0V	0V	0V
DATA	0V	4.9V	0V
ENA	0.1V	0.1V	0.1V
IF	0V	0V	0V
BM	11.4V	11.4V	11.4V
BL	11.3V	4.0V	0.2V
AGC	4.6V	4.9V	4.8V
BH	0V	11.3V	0V
BT	1.0V	4.2V	5.0V
BU	0.2V	0.2V	11.3V

Note: VHF Low Band voltages taken on channel 2.
VHF High Band voltages taken on channel 7.
UHF Band voltages taken on channel 14.

TUNER TERMINAL GUIDE

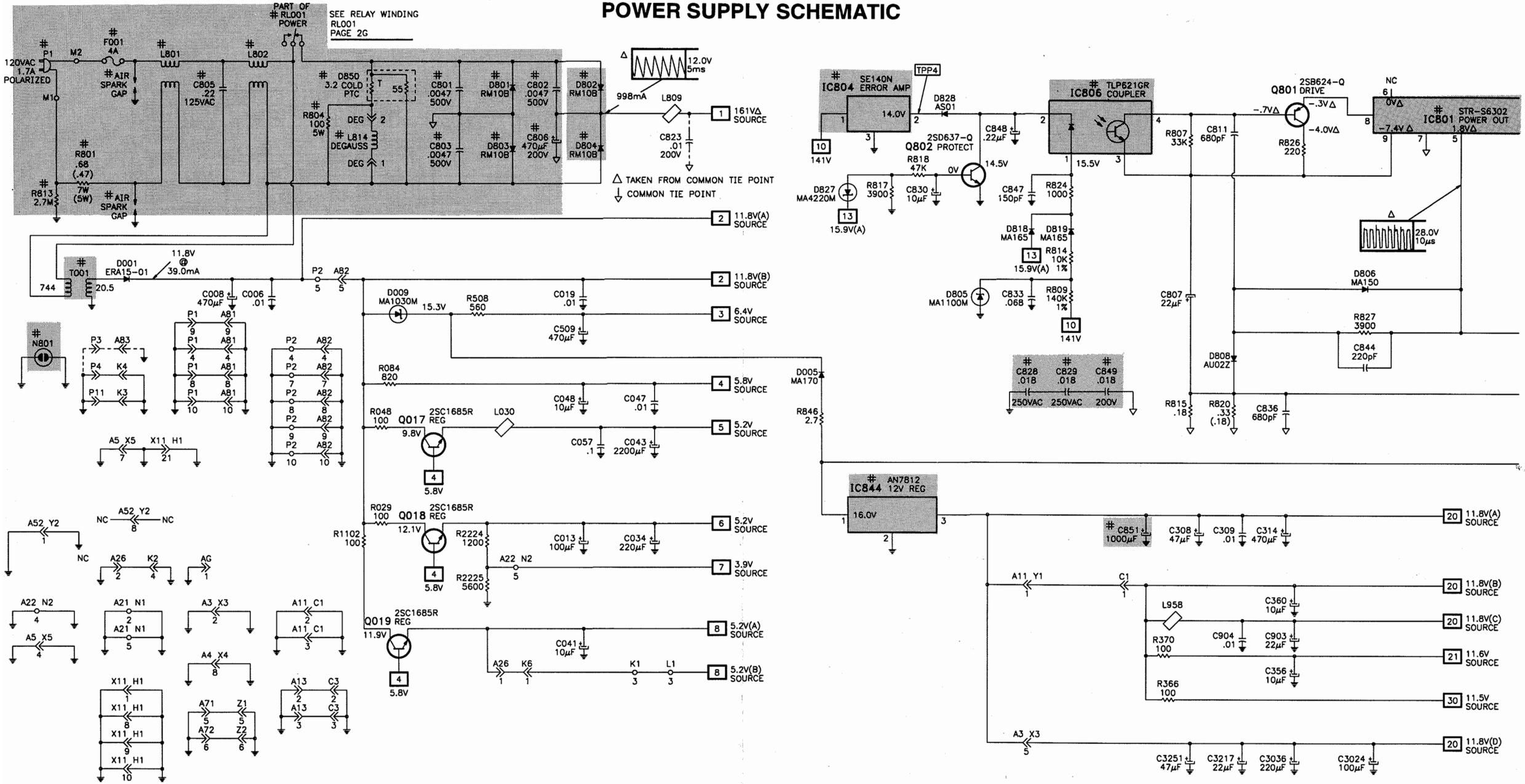


TEST EQUIPMENT

Test equipment listed by participating manufacturer illustrates typical or equivalent equipment used by Sams engineers to obtain measurements. This equipment is compatible with most types used by field service technicians.

Equipment	Sencore No.	Equipment	Sencore No.
Oscilloscope	SC3100	Isolation Transformer	PR57
Generators		Capacitance Analyzer	LC101, LC102
RGB	CM2000	CRT Analyzer	CR70
Multiburst Signal	VG91	AC Leakage Tester	PR57
Color Bar	VG91	Inductance Analyzer	LC101, LC102
TV Stereo	VG91	Flyback Yoke Tester	TVA92
Digital VOM	SC3100	TV Stereo Power Monitor	SR68, PA81
Frequency Meter	SC3100	Field Strength Meter	SL750
Hi-Voltage Probe	HP200	Transistor Tester	TF46
Accessory Probes	TP212	Video Analyzer	VG91, TVA92

POWER SUPPLY SCHEMATIC



ADDITIONAL SCHEMATIC NOTES, SEE PAGE 1

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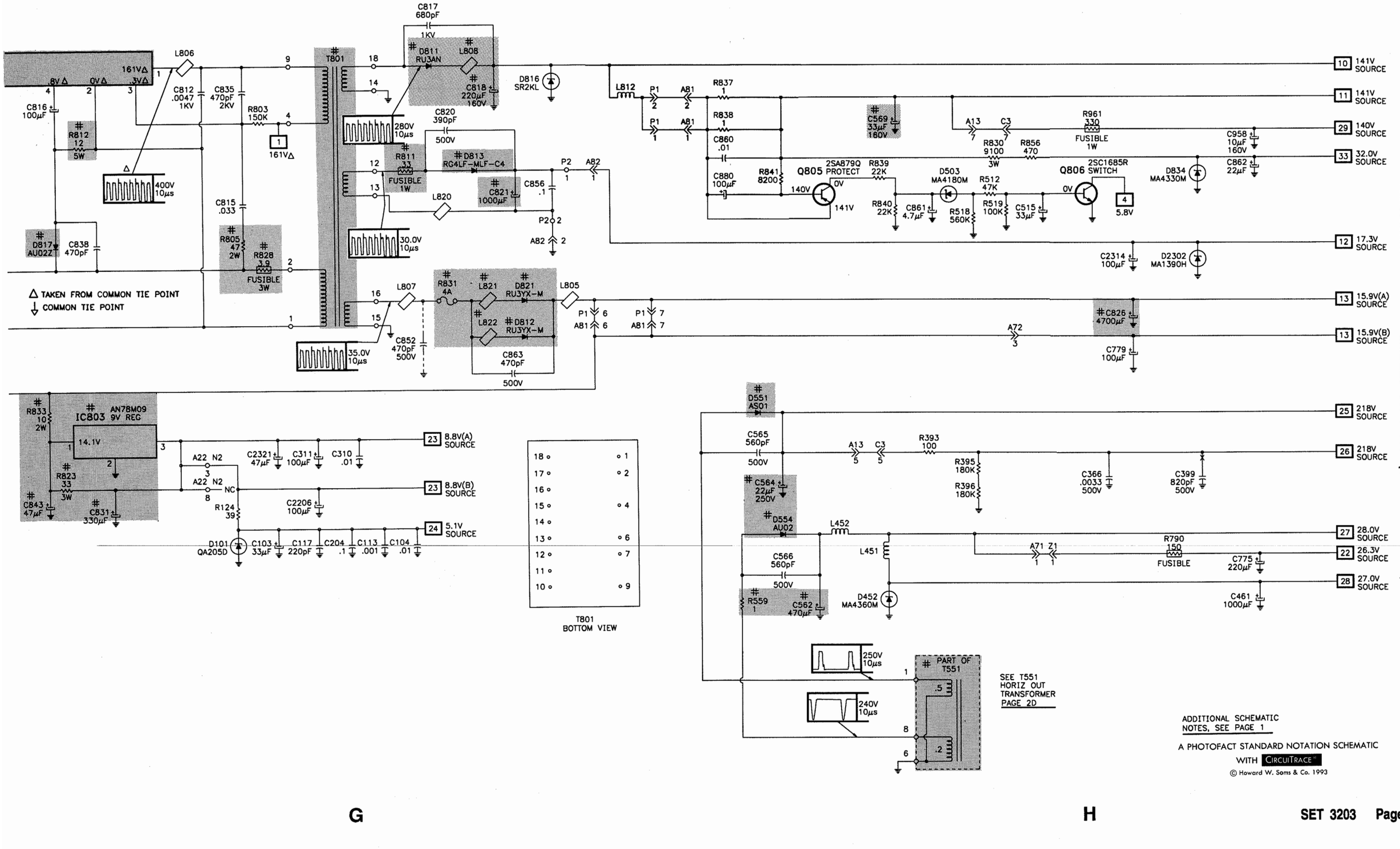
POWER SUPPLY SCHEMATIC continued


△ TAKEN FROM COMMON TIE POINT
⏚ COMMON TIE POINT
T801 BOTTOM VIEW
ADDITIONAL SCHEMATIC NOTES, SEE PAGE 1
SEE T551 HORIZ OUT TRANSFORMER PAGE 2D
A PHOTOFACT STANDARD NOTATION SCHEMATIC WITH CIRCUITRACE™
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PANASONIC MODELS CTP-2780SF (CHASSIS AEDP218)

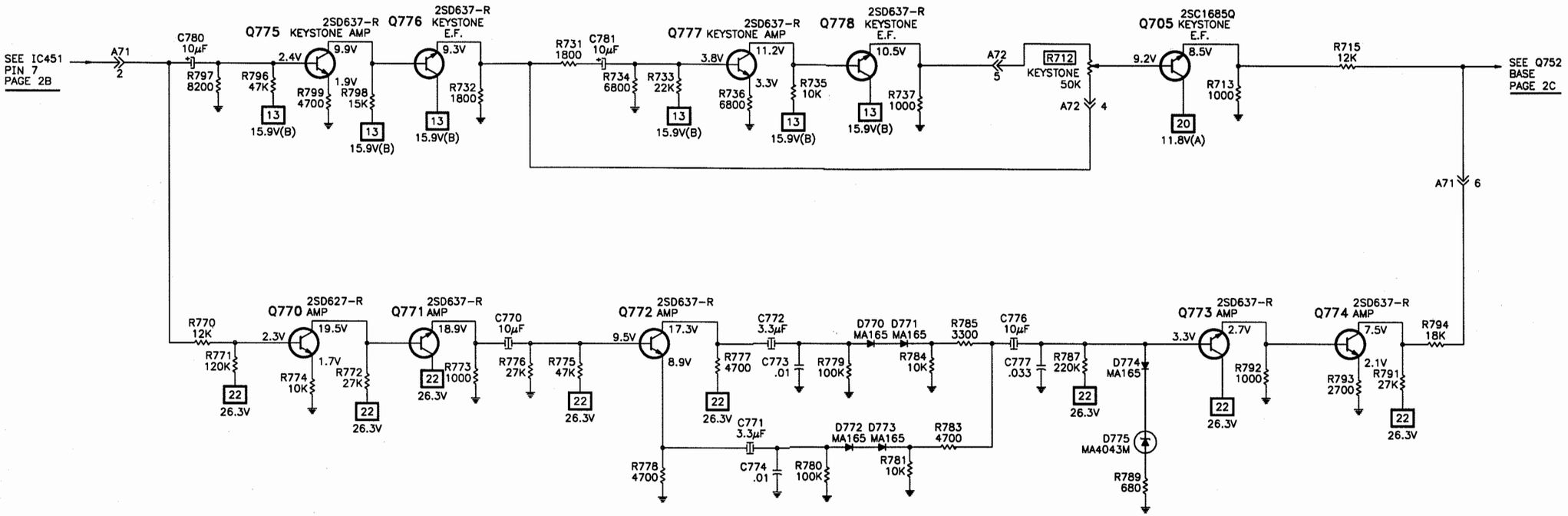
G H

SET 3203 Page 3

A

B

PINCUSHION SCHEMATIC



ADDITIONAL SCHEMATIC NOTES, SEE PAGE 1

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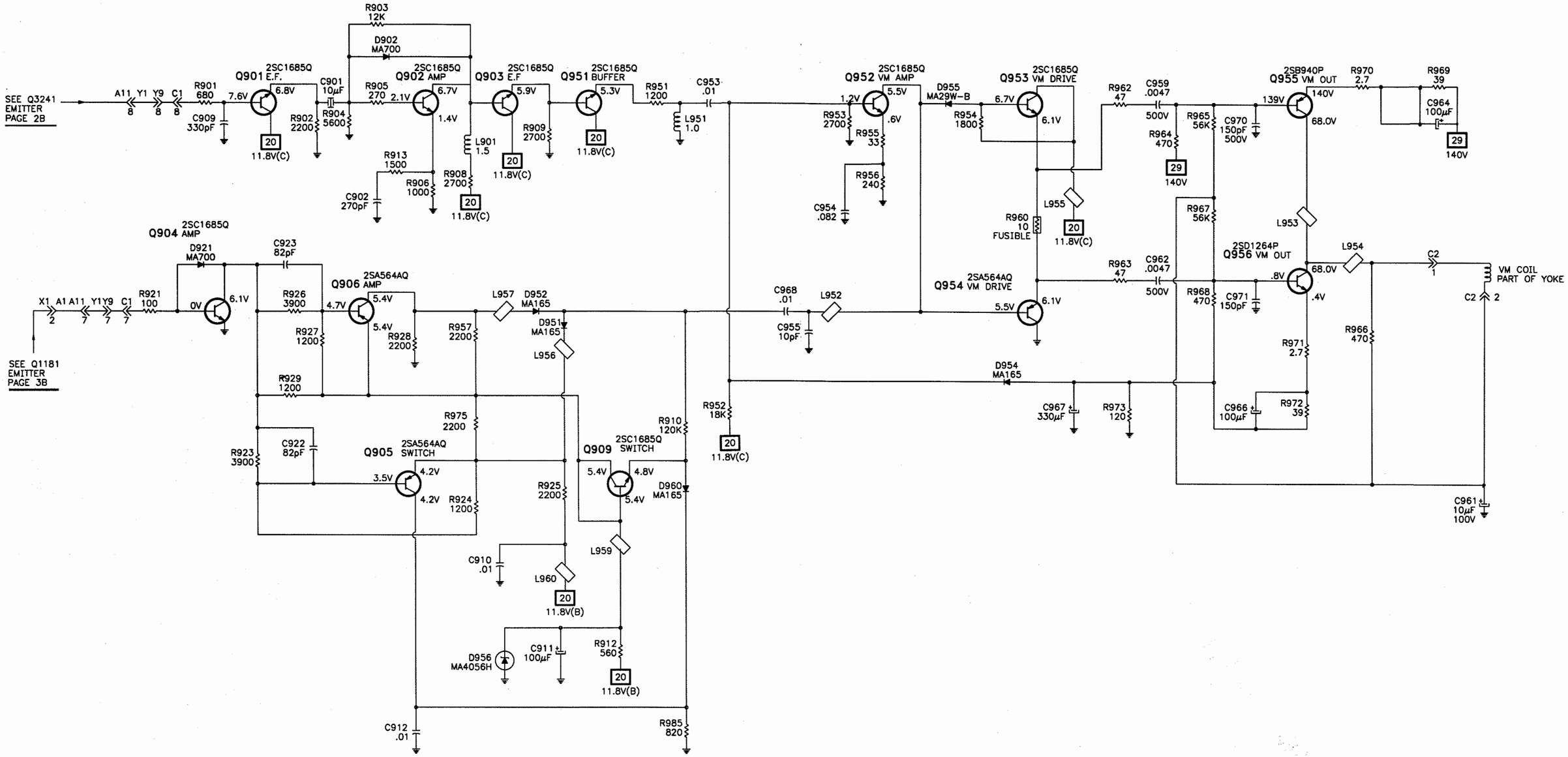
VELOCITY MODULATOR SCHEMATIC



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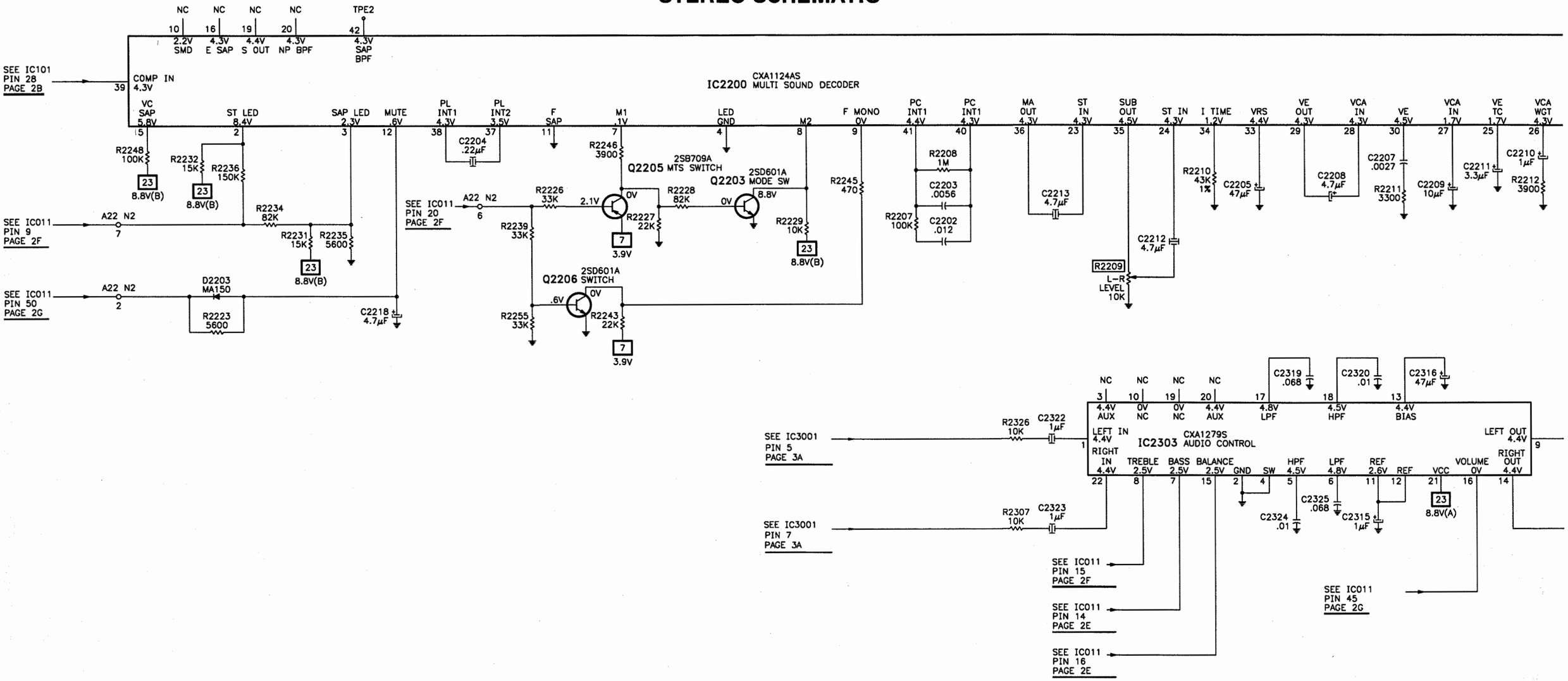
STEREO SCHEMATIC



ADDITIONAL SCHEMATIC NOTES, SEE PAGE 1

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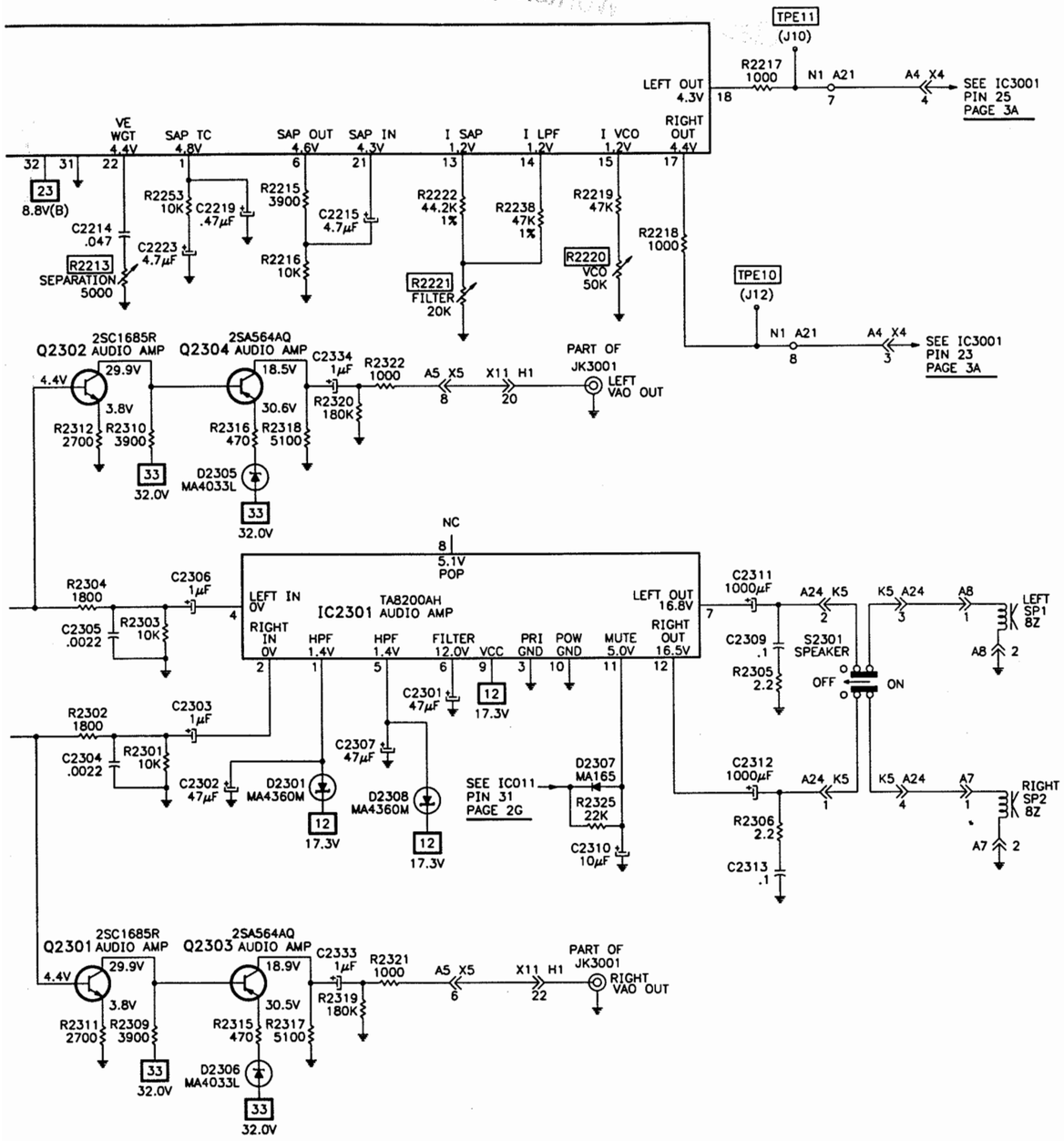
E

F

STEREO SCHEMATIC continued



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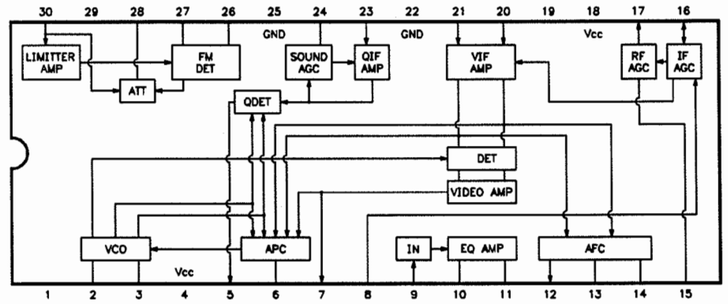
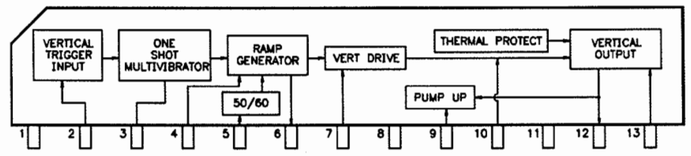
IC FUNCTIONS

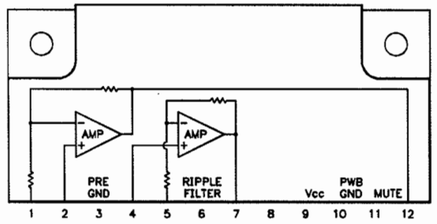
IC101
AN5179K



IC2301
TA8200AH

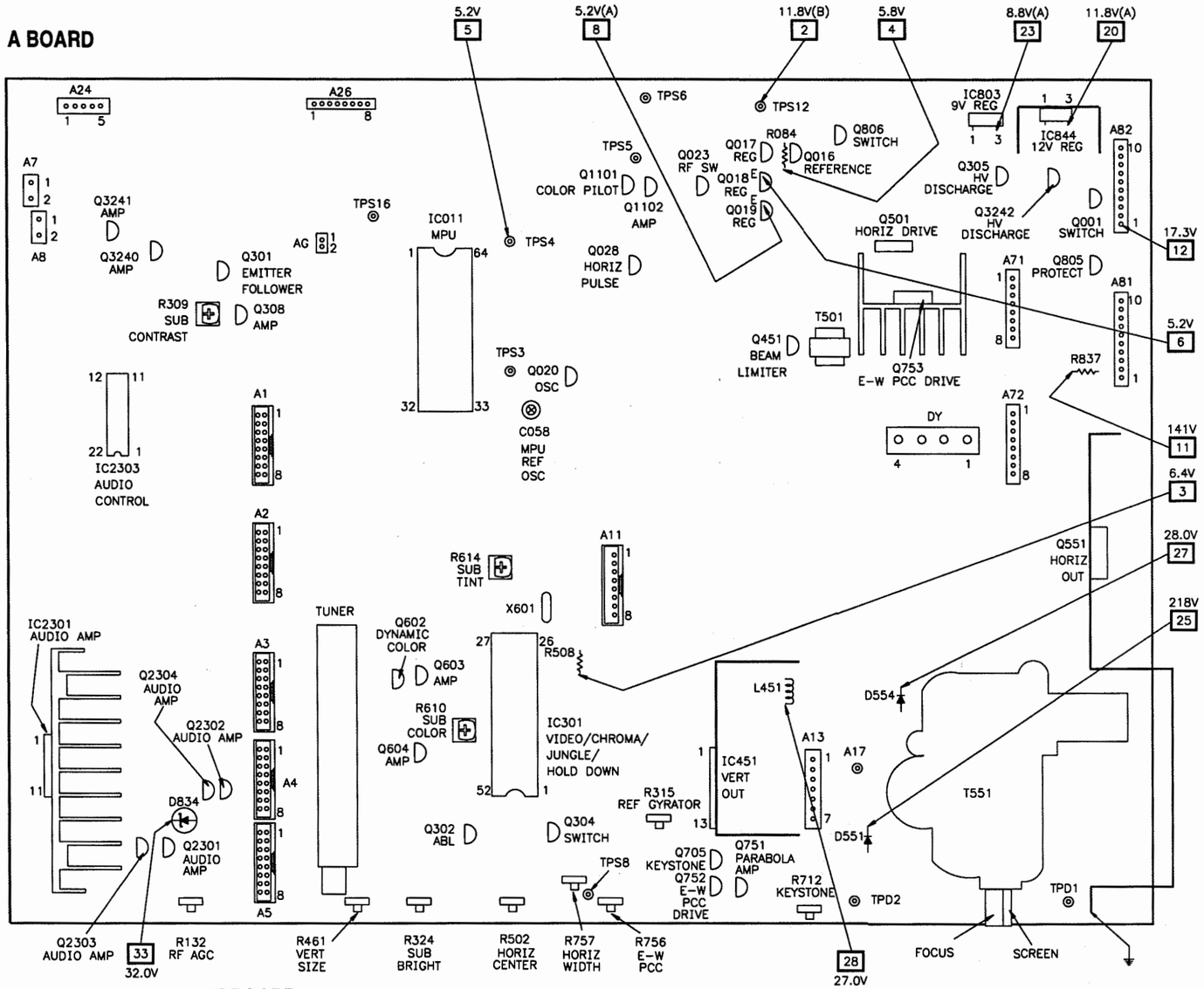


IC451
LA7838

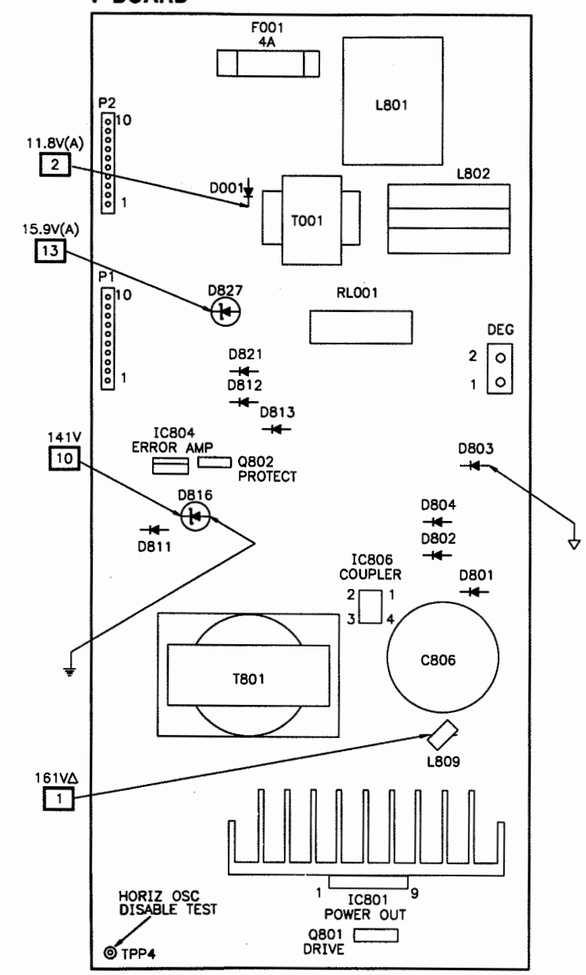


PLACEMENT CHART

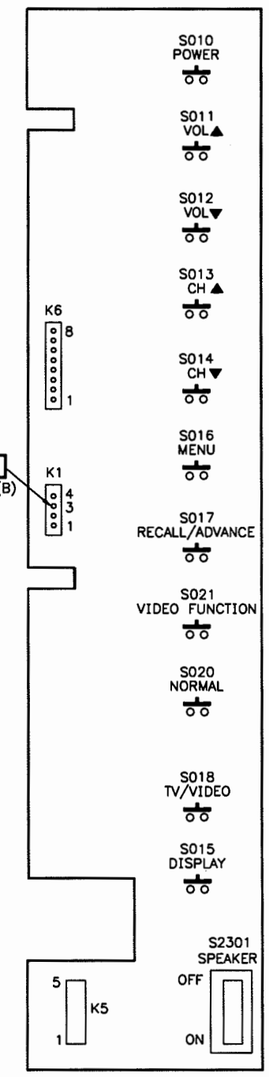
A BOARD



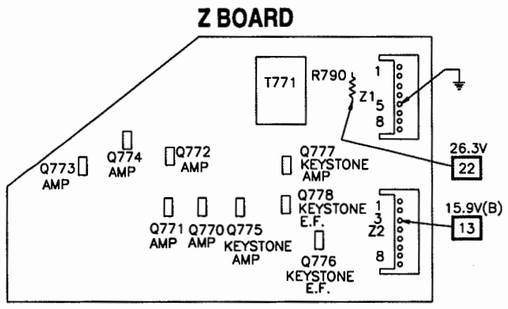
P BOARD



K BOARD

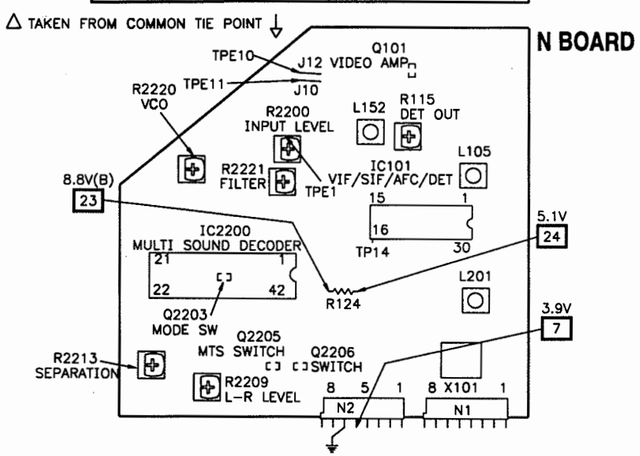


Z BOARD



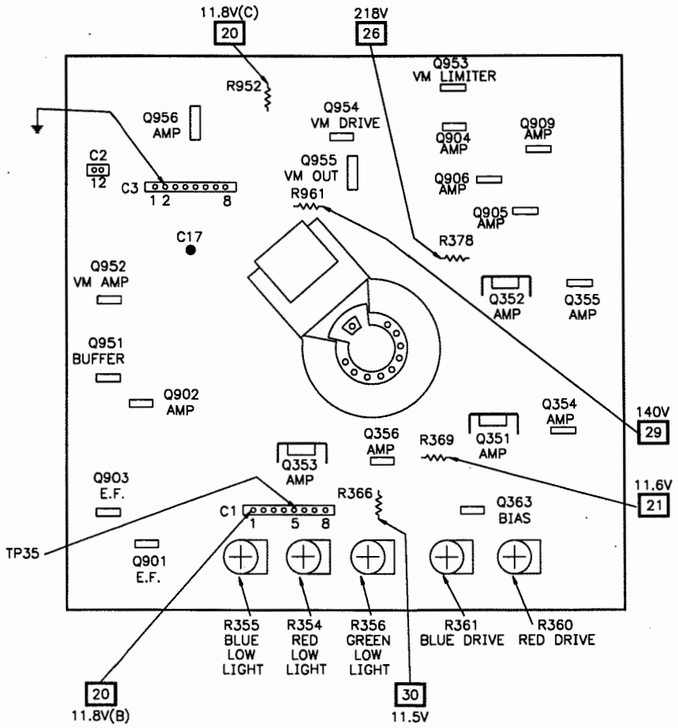
N BOARD

△ TAKEN FROM COMMON TIE POINT

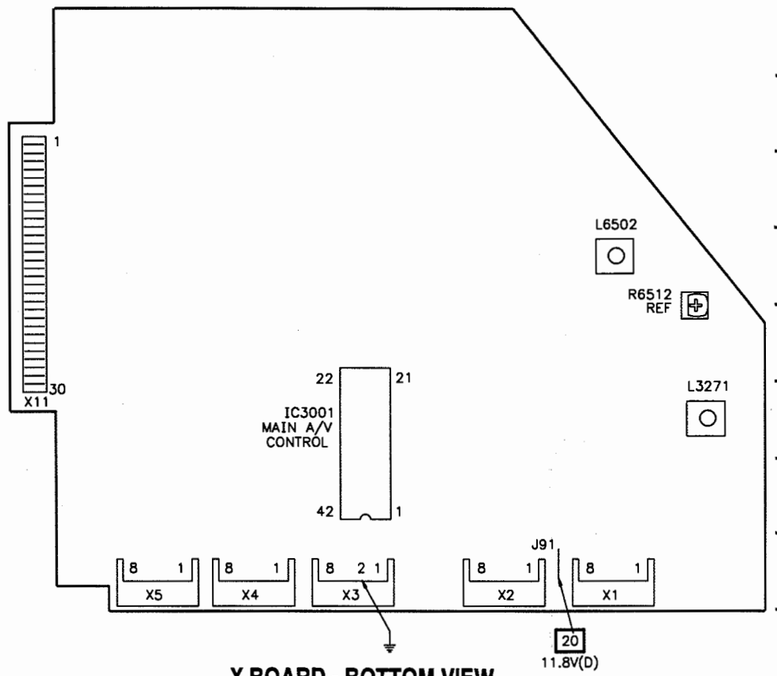


PLACEMENT CHART continued

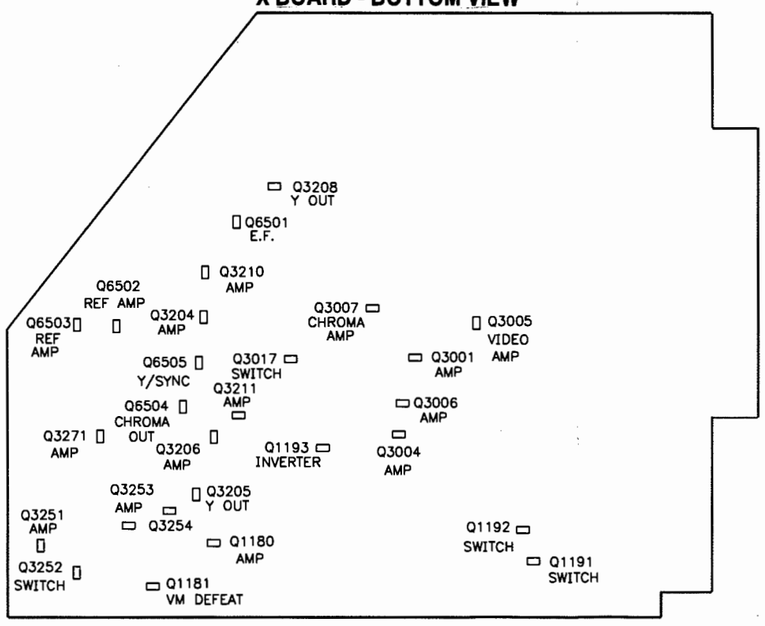
C BOARD



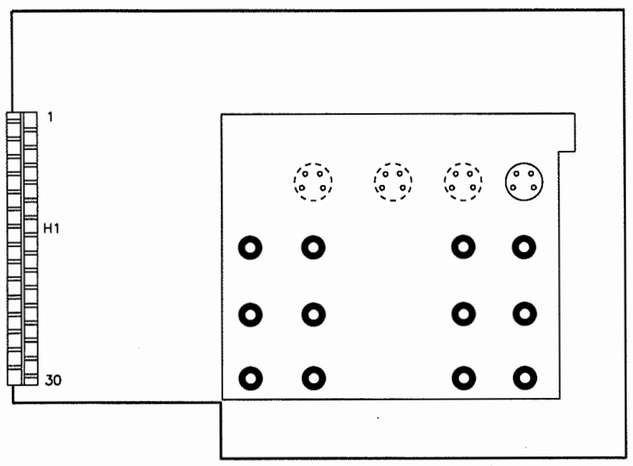
X BOARD - TOP VIEW



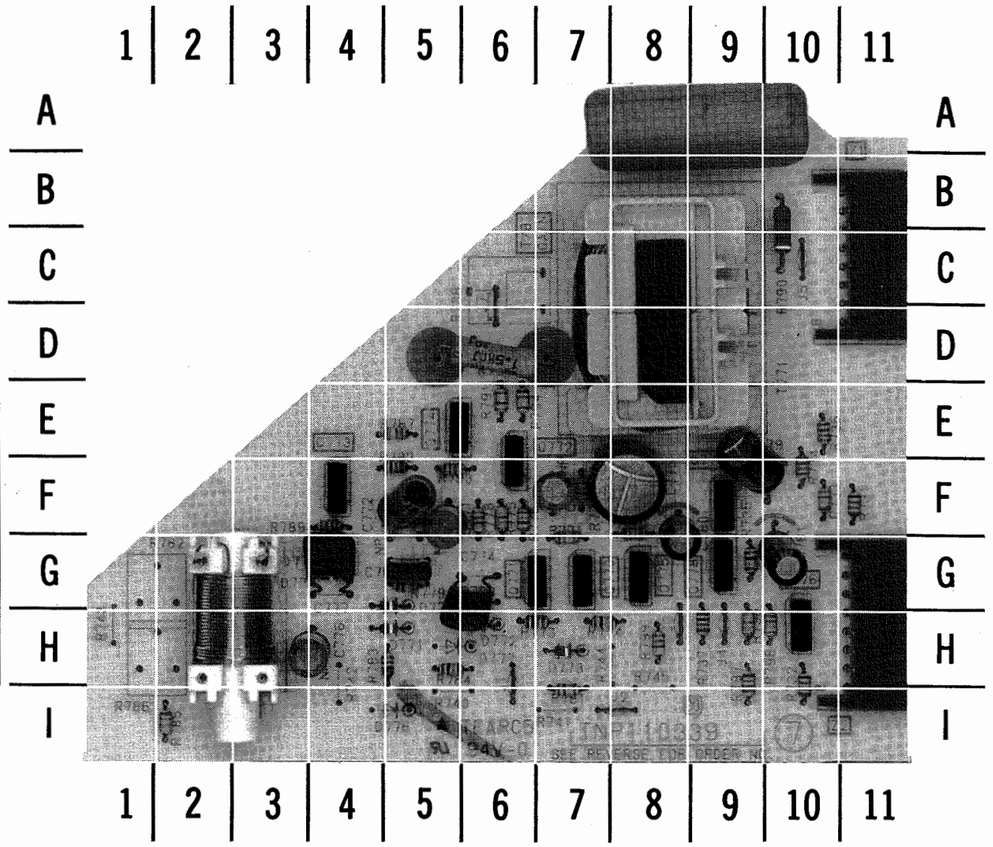
X BOARD - BOTTOM VIEW



H BOARD



Z BOARD

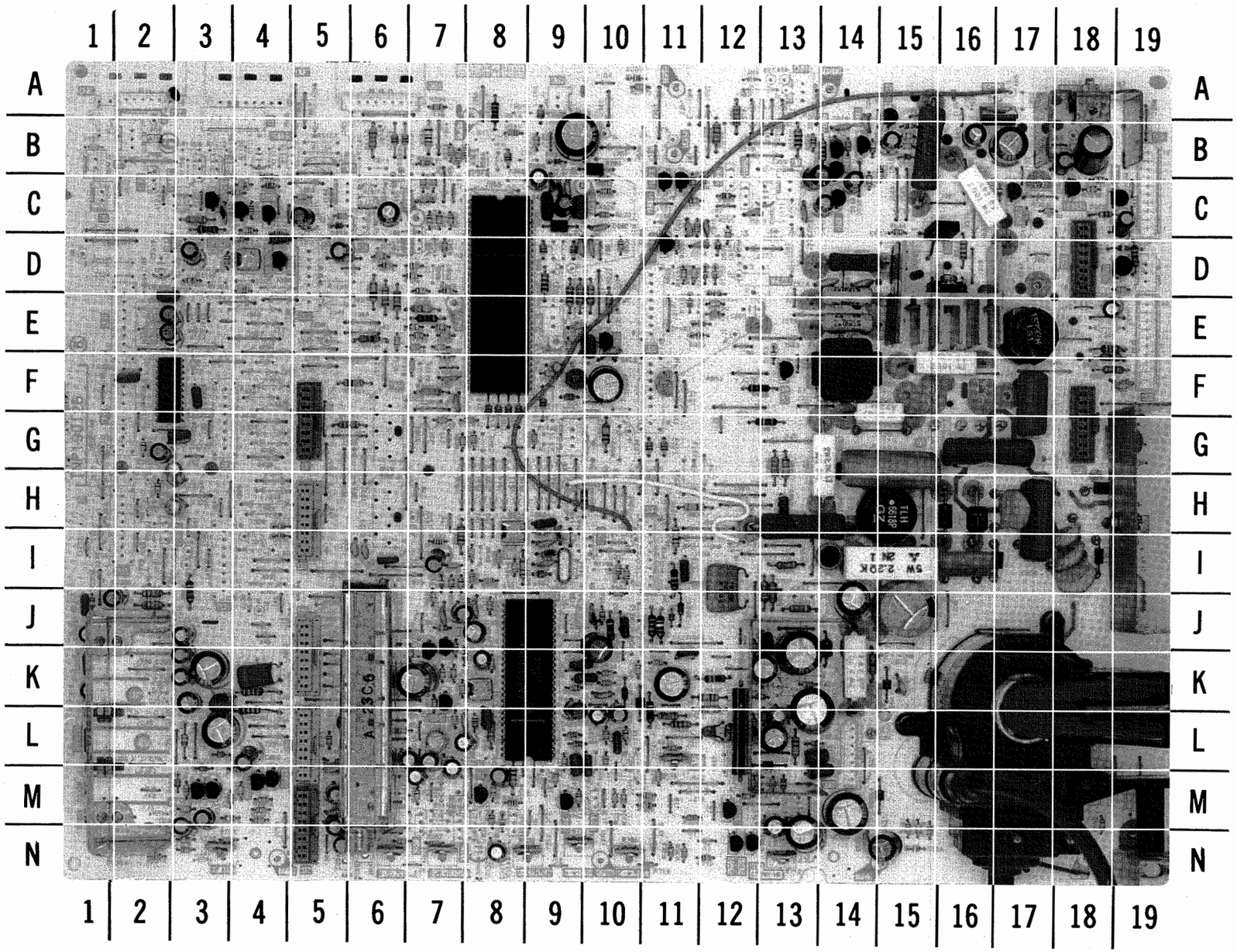


A HOWARD W. SAMS GRIDTRACE™ PHOTO

Z BOARD, GRIDTRACE LOCATION GUIDE

C770	F-7	C781	G-10	Q773	F-4	R736	E-10	R779	G-5	R793	F-5
C771	F-5	D770	G-5	Q774	E-5	R737	H-9	R780	G-6	R794	E-6
C772	F-5	D771	H-5	Q775	G-8	R770	F-8	R781	I-7	R795	D-6
C773	G-5	D772	H-6	Q776	H-10	R771	G-7	R783	H-5	R796	H-9
C774	G-6	D773	H-7	Q777	F-9	R772	F-7	R784	H-5	R797	H-9
C775	F-8	D774	G-4	Q778	G-9	R773	H-7	R785	I-2	R798	H-10
C776	H-4	D775	G-4	R731	F-11	R774	H-7	R787	E-5	R799	H-8
C777	G-4	L770	G-2	R732	H-10	R775	F-6	R789	F-4	T771	C-8
C778	A-9	Q770	G-7	R733	F-10	R776	F-6	R790	B-10	Z1	B-11
C779	F-10	Q771	G-7	R734	F-10	R777	F-5	R791	E-6	Z2	G-11
C780	G-8	Q772	E-6	R735	G-9	R778	F-6	R792	F-5		

A BOARD



A HOWARD W. SAMS GRIDTRACE™ PHOTO

A BOARD, GRIDTRACE LOCATION GUIDE

A1	F-5	C087	C-9	C563	N-15	D031	B-9	L026	D-9
A2	H-5	C099	E-9	C564	M-14	D032	E-11	L030	B-10
A3	J-5	C116	L-5	C565	N-14	D301	C-17	L451	J-14
A4	L-5	C126	M-5	C566	K-15	D303	B-18	L452	I-14
A5	M-5	C301	M-8	C567	I-19	D304	M-8	L551	H-15
A7	C-1	C302	L-8	C569	J-15	D451	L-13	L553	I-18
A8	B-1	C303	L-7	C601	K-8	D452	L-13	L554	H-18
A11	H-11	C304	L-7	C602	L-7	D453	E-13	L556	I-17
A13	L-14	C306	L-7	C603	I-9	D502	J-11	L602	I-9
A17	L-14	C308	J-7	C611	H-9	D503	B-15	L751	E-17
A21	I-6	C309	J-7	C613	I-9	D504	J-11	L1103	A-9
A22	G-6	C310	J-8	C614	I-9	D506	D-12	L1106	B-6
A24	A-2	C311	J-8	C615	I-9	D531	K-10	L1107	B-6
A26	A-6	C313	D-4	C751	L-13	D532	K-10	Q001	C-19
A71	C-18	C314	K-11	C752	M-13	D551	M-15	Q016	B-14
A72	F-18	C315	C-5	C753	N-13	D552	H-16	Q017	B-14
A81	F-19	C316	M-7	C754	N-13	D553	H-16	Q018	B-14
A82	C-19	C317	N-8	C756	F-17	D554	K-15	Q019	C-14
AG	C-6	C318	L-7	C831	B-17	D555	G-13	Q020	E-10
C001	K-7	C319	B-18	C832	I-6	D556	N-15	Q028	D-11
C002	M-5	C322	M-7	C843	B-16	D601	K-7	Q301	C-4
C003	N-5	C401	L-9	C851	B-18	D602	I-7	Q302	B-8
C004	N-5	C402	L-10	C860	F-19	D834	L-3	Q304	M-9
C005	N-6	C403	L-9	C861	C-19	D1101	D-12	Q305	C-17
C012	C-12	C451	L-12	C862	L-4	D1102	D-12	Q308	D-4
C013	B-13	C452	K-13	C880	E-18	D1103	E-11	Q451	F-13
C014	D-11	C453	L-13	C1101	I-7	D1104	D-12	Q501	C-16
C015	C-12	C454	K-13	C2301	K-3	D1105	E-11	Q551	H-19
C017	D-5	C455	L-13	C2302	J-1	D1116	I-4	Q602	K-7
C019	B-14	C456	J-12	C2303	K-1	D1117	H-4	Q603	K-7
C020	C-9	C458	J-13	C2304	K-1	D2301	M-1	Q604	K-7
C021	C-9	C461	L-13	C2305	J-1	D2302	L-3	Q705	M-12
C022	F-10	C501	L-10	C2306	J-1	D2305	M-3	Q751	N-12
C023	F-10	C502	K-9	C2307	K-3	D2306	M-3	Q752	N-12
C027	N-6	C503	L-10	C2309	K-4	D2307	A-10	Q753	D-16
C028	D-3	C504	K-11	C2310	J-3	D2308	M-1	Q805	D-19
C029	I-6	C506	K-9	C2311	K-3	DY	G-17	Q806	A-15
C030	I-6	C507	J-10	C2312	L-3	IC011	C-8	Q1101	C-11
C031	C-11	C508	J-10	C2313	K-3	IC301	L-9	Q1102	C-11
C032	C-9	C509	K-10	C2314	K-3	IC451	K-12	Q2301	M-3
C033	C-13	C510	I-11	C2315	E-2	IC803	A-17	Q2302	M-4
C034	C-6	C511	D-14	C2316	E-2	IC844	A-18	Q2303	M-3
C041	C-14	C514	D-14	C2319	D-2	IC2301	K-1	Q2304	M-4
C042	C-7	C515	B-15	C2320	F-2	IC2303	G-3	Q3240	C-4
C043	B-9	C531	L-10	C2321	G-2	L011	L-5	Q3241	C-3
C047	B-14	C532	K-10	C2322	H-3	L013	B-8	Q3242	C-18
C048	B-14	C551	G-16	C2323	H-3	L014	F-8	R001	C-17
C057	C-9	C552	I-16	C2324	F-3	LO15	F-8	R005	B-12
C058	F-9	C554	H-17	C2325	G-3	L016	F-8	R006	D-11
C059	B-9	C555	H-17	C2333	M-3	L017	F-8	R007	D-7
C075	E-10	C556	I-18	C2334	M-3	L019	F-9	R008	F-9
C082	C-10	C557	I-18	C3240	C-3	LO21	F-9	R010	D-9
C083	D-10	C558	I-18	D005	D-19	L022	C-9	R011	D-10
C084	D-10	C559	G-15	D009	C-18	L023	G-11	R013	G-10
C085	F-7	C560	H-13	D018	C-5	L024	G-11	R018	C-5
C086	F-7	C562	J-14	D030	C-14	L025	D-9	R020	E-10

C BOARD

A BOARD, GRIDTRACE LOCATION GUIDE continued

R021	E-9	R131	N-6	R469	L-13	R627	I-8	R2303	J-1
R022	E-10	R132	N-3	R470	K-12	R712	N-13	R2304	J-2
R023	C-10	R133	N-3	R501	L-9	R713	N-12	R2305	K-4
R025	A-12	R301	M-8	R502	N-9	R715	M-12	R2306	L-4
R027	B-8	R302	N-7	R503	K-9	R751	L-13	R2307	G-2
R028	D-6	R303	D-3	R506	J-11	R752	M-13	R2309	M-3
R029	B-14	R305	L-6	R507	J-11	R753	M-13	R2310	M-4
R030	D-9	R309	D-4	R508	J-10	R754	M-13	R2311	M-3
R031	D-9	R310	D-4	R509	J-10	R755	M-13	R2312	M-4
R032	C-10	R315	L-11	R511	I-11	R756	N-10	R2315	M-3
R033	D-5	R316	M-11	R512	B-15	R757	N-9	R2316	M-4
R034	D-10	R317	C-4	R513	D-16	R758	N-11	R2317	N-2
R035	C-10	R319	L-6	R514	C-15	R759	N-11	R2318	N-3
R037	C-3	R320	M-8	R515	E-14	R760	N-11	R2319	M-3
R038	C-3	R324	N-7	R516	D-14	R761	M-12	R2320	N-3
R040	F-7	R325	I-8	R517	D-14	R762	M-12	R2321	M-4
R041	C-7	R326	L-11	R518	B-15	R763	D-16	R2322	M-4
R042	D-7	R327	L-7	R519	B-15	R764	F-16	R2325	A-10
R043	G-8	R328	M-10	R531	L-11	R765	L-14	R2326	H-2
R044	I-8	R329	M-11	R532	K-10	R823	B-15	R3237	M-9
R046	G-9	R330	M-11	R533	K-10	R830	H-13	R3238	C-5
R048	B-13	R331	M-10	R534	K-10	R832	H-11	R3239	C-5
R049	I-7	R332	N-8	R535	K-11	R833	C-16	R3240	M-11
R050	J-8	R334	L-10	R536	I-11	R837	F-18	R3241	C-17
R051	B-15	R336	L-10	R551	N-15	R838	E-18	R3244	C-4
R052	B-14	R337	L-10	R552	M-18	R839	D-19	R3245	C-4
R053	C-14	R339	I-7	R553	I-15	R840	B-16	R3246	C-4
R054	G-7	R340	D-4	R554	N-15	R841	E-18	R3247	C-4
R056	I-8	R341	L-9	R555	N-15	R846	D-19	R3248	B-4
R057	C-11	R342	M-8	R556	K-14	R856	J-3	R3249	C-4
R058	C-12	R343	M-8	R557	G-14	R1101	I-7	R3250	B-18
R059	I-7	R344	M-7	R558	F-14	R1102	B-13	R3299	C-18
R061	F-7	R345	H-10	R559	K-14	R1103	A-8	T501	F-14
R062	E-7	R349	M-9	R599A	N-17	R1110	B-6	T551	K-17
R063	E-7	R401	L-9	R599B	N-17	R1116	F-7	TPD1	N-18
R064	E-7	R402	L-11	R601	L-8	R1117	G-6	TPD2	N-15
R065	E-7	R403	L-11	R602	K-8	R1120	E-12	TPS3	E-9
R066	E-7	R404	L-10	R603	J-10	R1121	E-12	X011	C-9
R070	B-7	R411	C-12	R604	I-10	R1122	D-11	X012	F-9
R071	B-7	R451	J-13	R605	I-10	R1123	D-11	X501	J-9
R072	B-7	R452	K-12	R608	H-9	R1124	C-11	X601	I-9
R074	D-6	R453	L-12	R609	J-7	R1125	C-11		
R075	D-6	R454	J-12	R610	K-8	R1126	C-11		
R076	D-7	R455	J-13	R612	K-7	R1131	F-6		
R077	D-7	R456	K-13	R613	I-8	R1134	E-6		
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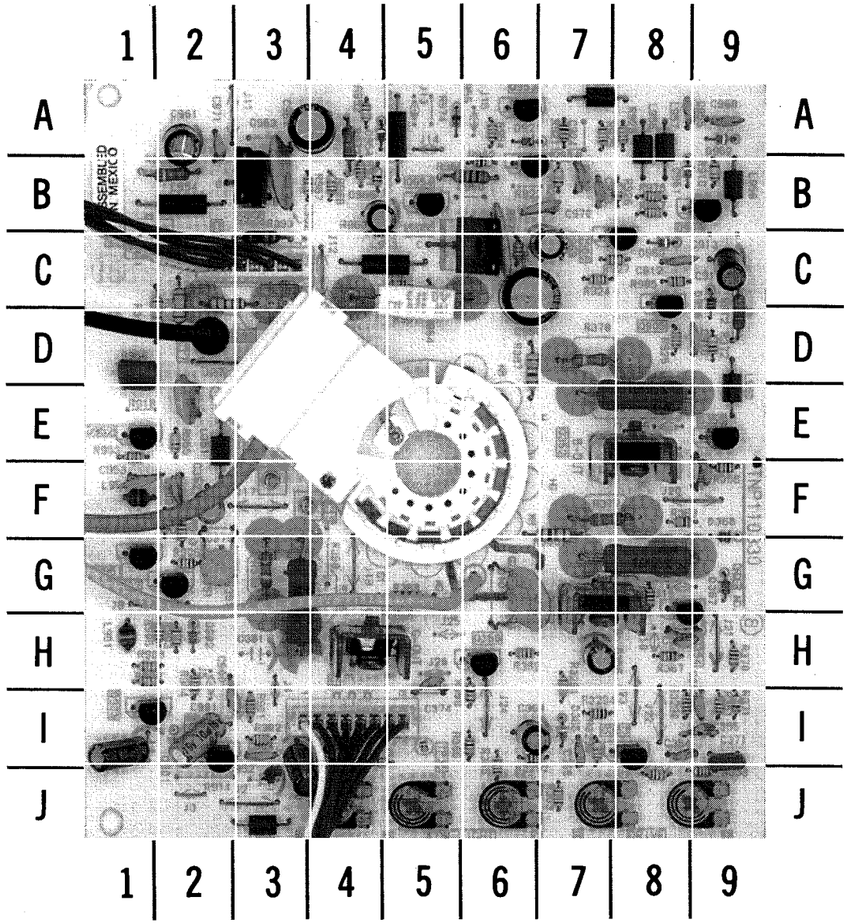
R079	C-7	R458	L-13	R615	I-8	R1147	G-8		
R082	C-7	R459	J-13	R616	K-7	R1148	E-7		
R083	B-9	R460	I-13	R617	L-7	R1149	G-7		
R084	B-14	R461	N-6	R618	K-7	R1150	E-7		
R088	B-7	R463	K-13	R620	K-7	R1153	E-6		
R089	B-7	R464	J-13	R621	J-7	R1154	E-7		
R094	A-7	R465	G-13	R622	K-7	R2224	E-6		
R099	D-7	R466	G-13	R623	J-7	R2225	E-6		
R129	L-5	R467	G-13	R624	L-8	R2301	K-1		
R130	M-5	R468	F-13	R626	I-7	R2302	J-2		



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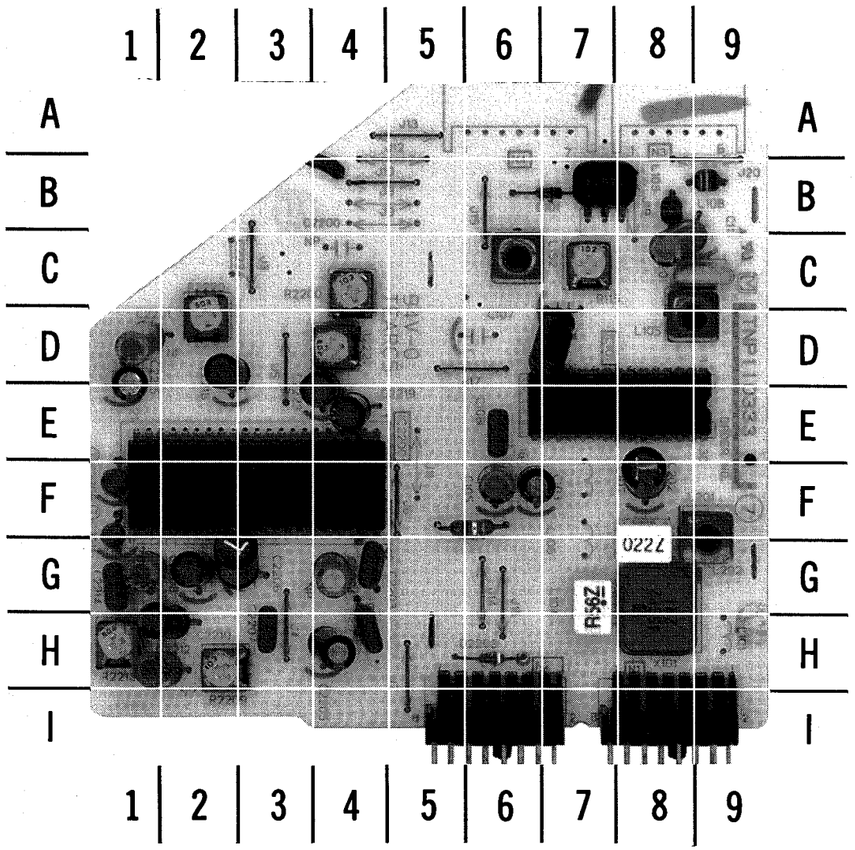
C BOARD, GRIDTRACE LOCATION GUIDE

C10	G-6	L952	A-7	R379	G-3
C11	F-3	L953	C-4	R386	F-7
C17	D-2	L954	B-2	R387	D-6
C19	F-3	L955	A-5	R388	G-5
C351	G-6	L956	A-8	R392	C-2
C352	F-2	L957	A-8	R393	C-3
C353	I-9	L958	J-3	R395	D-2
C354	I-8	L959	B-9	R396	D-2
C355	I-9	L960	E-9	R901	I-3
C356	H-7	Q351	G-7	R902	I-3
C360	I-3	Q352	E-8	R903	H-2
C364	I-6	Q353	H-4	R904	H-2
C365	I-7	Q354	G-8	R905	H-2
C366	E-2	Q355	E-9	R906	G-2
C371	I-9	Q356	H-6	R908	H-1
C372	H-8	Q363	I-8	R909	H-1
C373	F-9	Q901	I-2	R910	B-9
C374	H-5	Q902	G-2	R912	D-9
C399	F-8	Q903	I-1	R913	F-2
C901	I-2	Q904	B-6	R921	A-7
C902	F-2	Q905	C-8	R923	B-7
C903	I-1	Q906	C-8	R924	C-7
C904	I-3	Q909	B-9	R925	D-8
C909	I-2	Q951	G-1	R926	B-8
C910	D-9	Q952	E-1	R927	C-8
C911	C-9	Q953	A-6	R928	A-8
C912	C-8	Q954	B-5	R929	A-7
C922	B-7	Q955	C-6	R951	F-2
C923	B-7	Q956	B-3	R952	A-4
C953	F-1	R351	I-9	R953	E-1
C954	D-1	R352	J-8	R954	A-6
C955	A-8	R353	J-9	R955	E-2
C958	C-6	R354	J-5	R956	D-1
C959	C-6	R355	J-4	R957	B-8
C961	A-2	R356	J-6	R960	B-6
C962	B-3	R357	G-8	R961	C-5
C964	C-7	R358	F-9	R962	B-6
C966	B-4	R359	I-6	R963	C-4
C967	A-3	R360	J-9	R964	C-5
C968	A-9	R361	J-7	R965	C-5
C970	B-6	R363	J-7	R966	B-2
C971	A-2	R364	J-4	R967	B-3
D366	I-7	R365	J-6	R968	B-4
D367	G-9	R366	I-6	R969	C-7
D368	E-9	R367	H-8	R970	C-6
D902	H-2	R368	F-8	R971	B-4
D921	A-6	R369	H-6	R972	B-4
D951	B-8	R370	H-9	R973	A-4
D952	A-9	R371	I-9	R975	B-8
D954	A-4	R372	D-9	R985	C-8
D955	A-5	R373	I-4	R3290	I-8
D956	C-9	R374	G-8	R3291	I-7
D960	C-8	R375	E-8	R3292	I-6
L351	E-2	R376	G-3	R3293	I-7
L901	H-1	R377	F-7	R3294	I-7
L951	F-1	R378	D-7	TP35	I-5

N BOARD - TOP VIEW



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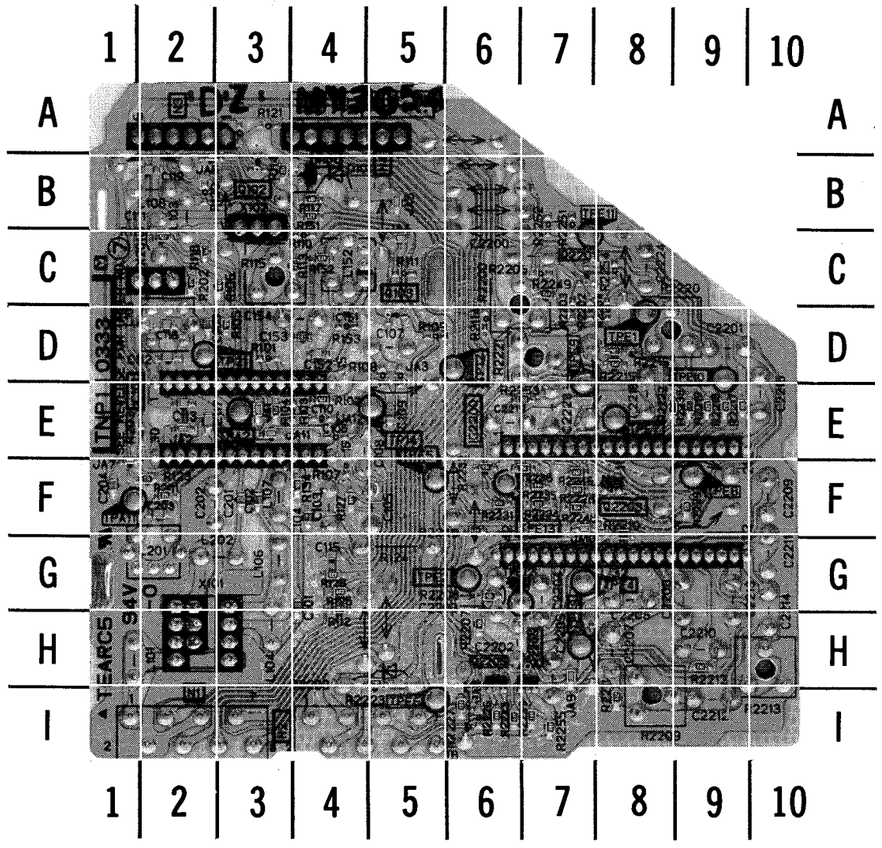
N BOARD - TOP VIEW, GRIDTRACE LOCATION GUIDE

C103	F-6	C2204	G-4	C2213	G-1	IC2200	E-4	N2	I-7	TPE11	B-5
C105	F-6	C2205	H-4	C2214	G-1	L103	B-8	R115	C-7	X101	G-8
C108	E-6	C2206	G-3	C2215	D-1	L104	G-7	R124	F-6	X102	B-7
C111	C-9	C2207	H-3	C2218	D-2	L105	D-8	R2200	C-4	X201	C-9
C154	D-7	C2208	G-2	C2219	E-4	L108	B-9	R2209	H-2		
C202	F-8	C2209	F-1	C2223	E-4	L152	C-6	R2220	D-2		
C2201	D-1	C2210	H-2	D101	B-7	L201	F-9	R2221	D-4		
C2202	H-4	C2211	G-1	D2203	H-6	L202	G-8	TPE1	C-6		
C2203	G-4	C2212	H-1	IC101	D-9	N1	I-9	TPE10	B-5		

N BOARD - BOTTOM VIEW



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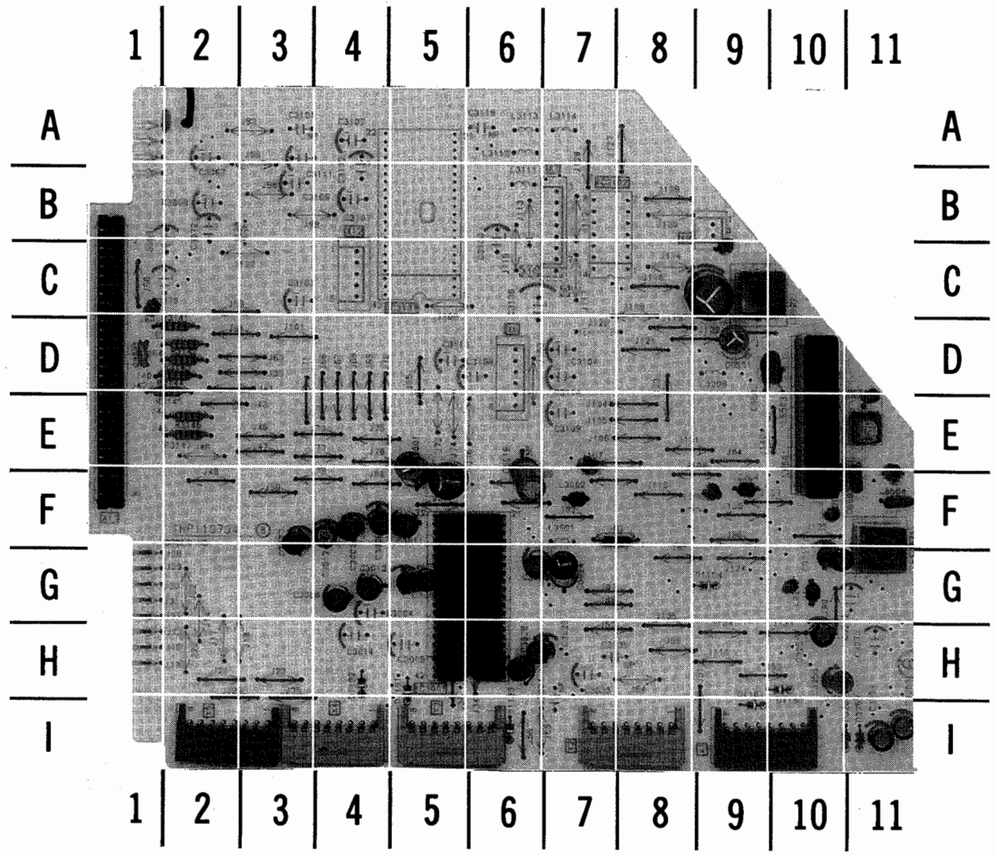
N BOARD - BOTTOM VIEW, GRIDTRACE LOCATION GUIDE

C101	G-4	C203	F-2	R112	H-4	R152	C-4	R2218	E-9	R2236	F-7
C102	F-3	C204	F-1	R113	C-4	R201	F-2	R2219	E-9	R2238	E-9
C104	F-4	C205	D-2	R114	B-3	R202	C-2	R2222	E-8	R2239	N-7
C109	E-5	C212	D-2	R117	B-4	R2207	H-6	R2223	H-5	R2243	I-6
C113	E-2	Q101	B-4	R118	C-2	R2208	G-6	R2226	I-6	R2245	F-6
C115	G-4	Q2203	F-8	R119	C-2	R2210	G-8	R2227	I-6	R2246	F-7
C117	E-2	Q2205	H-6	R123	F-2	R2211	I-8	R2228	F-7	R2248	F-7
C118	D-2	Q2206	H-7	R126	G-4	R2212	H-9	R2229	F-9	R2249	C-7
C119	B-2	R102	E-4	R127	F-4	R2213	H-1	R2231	F-6	R2253	E-7
C151	D-4	R104	E-3	R128	G-4	R2215	D-8	R2232	F-6	R2255	I-7
C153	D-4	R105	D-3	R134	F-4	R2216	D-8	R2234	F-7		
C201	F-3	R106	C-3	R151	C-4	R2217	E-9	R2235	F-7		

X BOARD - TOP VIEW



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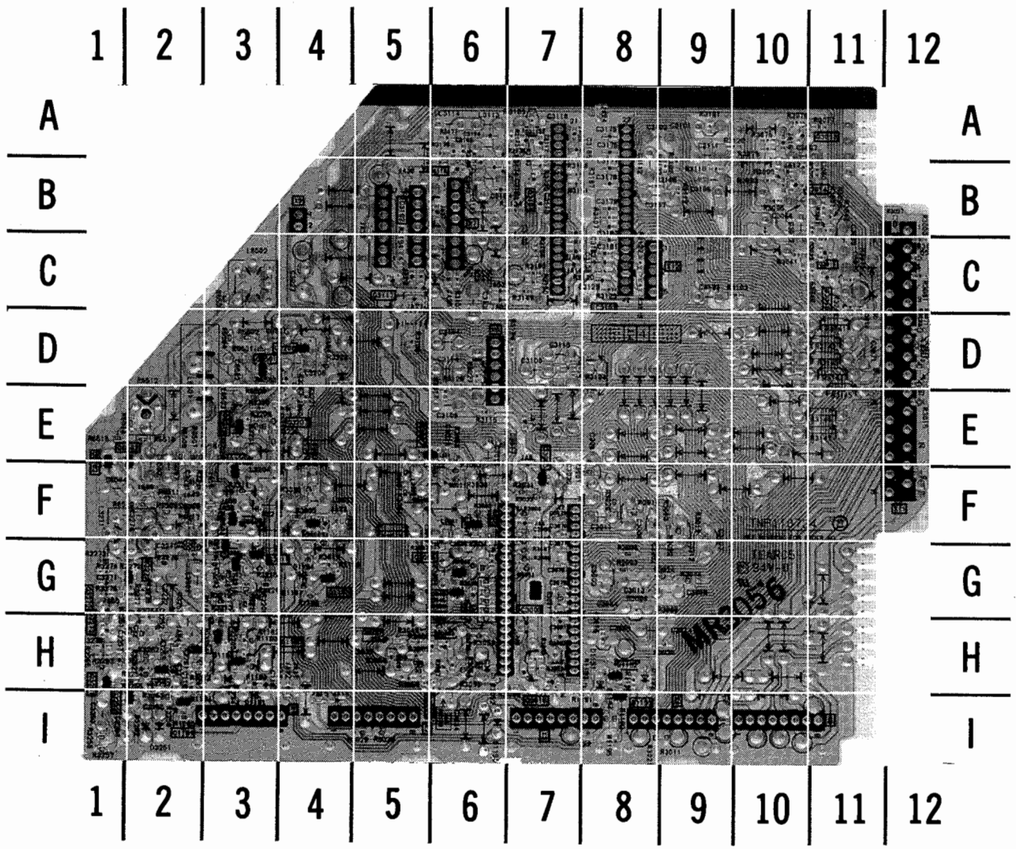
X BOARD - TOP VIEW, GRIDTRACE LOCATION GUIDE

C3001	E-5	C3024	G-7	C3254	I-11	D1192	H-4	L3271	G-11	R3147	E-2
C3002	F-4	C3027	C-9	C3256	H-10	D1193	I-6	L6501	D-10	R6512	E-11
C3003	G-5	C3028	H-6	C3274	F-2	D1194	G-9	L6502	C-9	X1	I-10
C3006	F-4	C3029	H-6	C6501	D-9	D3251	I-11	R3043	F-7	X2	I-8
C3007	G-3	C3030	G-6	C6502	D-10	D3252	I-11	R3141	D-2	X3	I-6
C3008	G-4	C3036	F-5	C6503	F-11	IC3001	H-6	R3142	D-2	X4	I-4
C3011	F-5	C3071	D-1	C6504	F-11	L3002	F-7	R3143	D-2	X5	I-3
C3012	F-4	C3217	G-10	D1180	H-10	L3202	G-10	R3144	D-2	X11	B-1
C3013	G-4	C3251	H-10	D1181	I-9	L3204	F-9	R3145	E-2		
C3018	F-6	C3253	I-11	D1191	H-5	L3207	F-10	R3146	G-2		

X BOARD - BOTTOM VIEW



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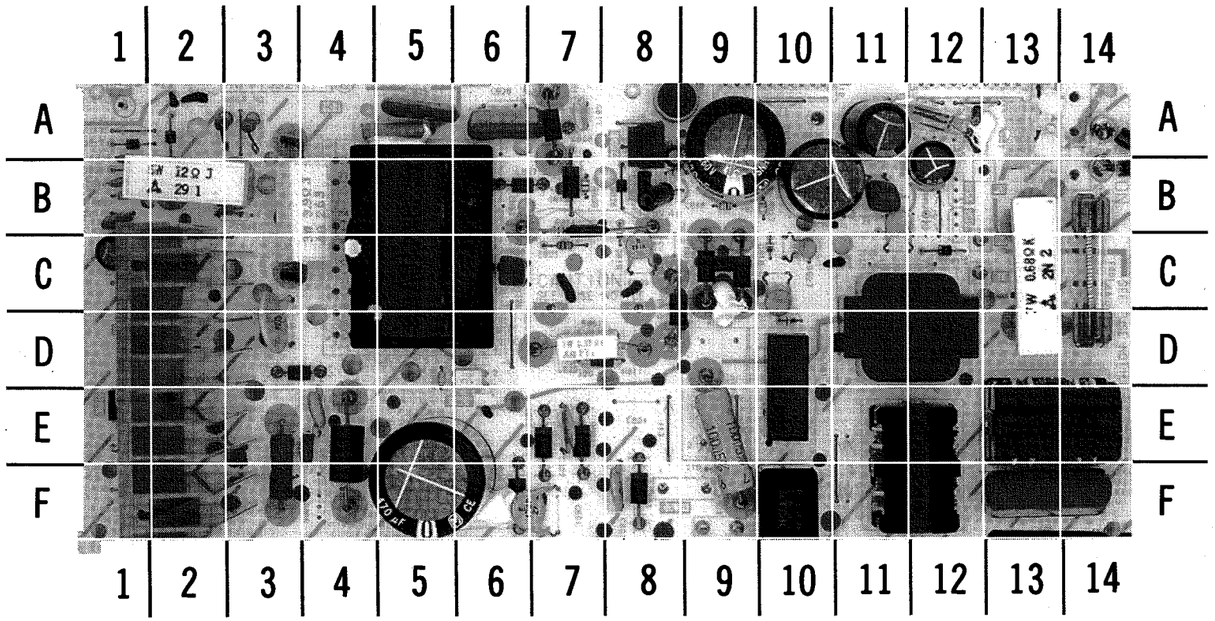
X BOARD - BOTTOM VIEW, GRIDTRACE LOCATION GUIDE

C3017	E-6	R1185	I-2	R3001	F-8	R3071	D-12	R3217	G-3	R3258	I-2	R6506	E-3
C3019	F-6	R1191	N-8	R3002	F-8	R3083	F-6	R3218	G-3	R3259	H-2	R6507	E-2
C3021	F-6	R1192	I-8	R3003	G-8	R3086	G-7	R3219	G-3	R3261	H-2	R6508	E-2
C3022	F-6	R1193	H-8	R3005	F-4	R3087	G-7	R3223	D-4	R3262	H-2	R6509	F-2
C3023	F-4	R1194	I-8	R3006	G-8	R3088	F-7	R3228	G-3	R3263	H-2	R6510	F-2
C3025	F-4	R1197	G-4	R3007	G-7	R3089	F-7	R3230	E-3	R3270	E-2	R6511	F-2
C3032	E-6	R1198	G-4	R3010	F-8	R3203	D-4	R3231	E-3	R3271	F-2	R6513	E-2
C3075	F-7	R3001	F-8	R3011	I-9	R3209	E-3	R3233	E-3	R3272	G-2	R6514	E-2
C3076	F-7	R3002	F-8	R3012	F-9	R3210	F-3	R3251	H-2	R3273	G-1	R6515	E-1
C3077	G-7	R3003	G-8	R3013	D-12	R3211	F-3	R3252	H-2	R3279	G-2	R6516	G-2
C3078	G-7	R3005	F-4	R3014	G-9	R3212	H-2	R3253	H-1	R6501	D-3	R6517	F-2
C3079	G-7	R3006	G-8	R3015	E-12	R3213	G-3	R3254	H-2	R6502	D-3	R6518	G-3
C3080	G-7	R3007	G-7	R3019	G-4	R3214	G-3	R3255	H-2	R6503	D-3	R6519	G-4
C3085	F-7	R3010	F-8	R3020	F-8	R3215	G-3	R3256	I-1	R6504	D-3	R6520	E-3
C3201	F-2	R3011	I-9	R3021	I-8	R3216	G-3	R3257	I-1	R6505	C-3		
C3202	G-3	R3012	F-9	R3022	F-9								
C3203	G-3	R3013	D-12	R3023	D-12								
C3205	F-3	R3014	G-9	R3024	G-9								
C3252	H-2	R3015	E-12	R3025	D-12								
C3255	I-2	R3019	G-4	R3028	I-5								
C3270	G-2	R3020	F-8	R3029	I-5								
C6505	F-2	R3021	I-8	R3030	F-4								
Q1180	H-3	R3022	F-9	R3031	F-7								
Q1181	I-2	R3023	D-12	R3033	F-7								
Q1191	N-8	R3024	G-9	R3034	F-6								
Q1192	H-8	R3025	D-12	R3035	F-6								
Q1193	G-4	R3028	I-5	R3036	G-6								
Q3001	F-6	R3029	I-5	R3037	G-6								
Q3004	G-6	R3030	F-4	R3038	F-6								
Q3005	F-7	R3031	F-7	R3045	G-6								
Q3006	G-6	R3033	F-7	R3046	G-6								
Q3007	E-5	R3034	F-6	R3048	G-6								
Q3017	F-4	R3035	F-6	R3049	H-6								
Q3204	F-3	R3036	G-6	R3050	G-6								
Q3205	H-3	R3037	G-6	R3051	G-7								
Q3206	G-3	R3038	F-6	R3052	H-6								
Q3208	D-4	R3045	G-6	R3053	H-6								
Q3210	E-3	R3046	G-6	R3054	H-6								
Q3211	G-3	R3048	G-6	R3055	C-12								
Q3251	H-1	R3049	H-6	R3056	G-6								
Q3252	I-2	R3050	G-6	R3057	B-12								
Q3253	H-2	R3051	G-7	R3060	G-6								
Q3254	H-2	R3052	H-6	R3061	F-5								
Q3271	G-2	R3053	H-6	R3062	F-6								
Q6501	D-3	R3054	H-6	R3063	E-6								
Q6502	F-2	R3055	C-12	R3064	F-5								
Q6503	F-1	R3056	G-6										
Q6504	G-3	R3057	B-12										
Q6505	F-3	R3060	G-6										
R1180	H-3	R3061	F-5										
R1181	H-3	R3062	F-6										
R1183	H-3	R3063	E-6										
R1184	I-2	R3064	F-5										

P BOARD



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P BOARD, GRIDTRACE LOCATION GUIDE

C006	C-11	C826	B-10	D801	F-6	D828	B-8	L821	C-9	R812	B-2
C008	B-12	C828	A-6	D802	E-7	D850	F-10	L822	C-9	R813	B-13
C801	F-7	C829	A-5	D803	F-8	DEG	F-9	N801	A-12	R814	B-7
C802	E-7	C830	A-8	D804	E-7	F001	B-14	P1	A-9	R815	A-3
C803	F-8	C833	C-6	D805	C-7	IC801	D-1	P2	A-12	R817	B-10
C805	F-13	C835	E-4	D806	B-1	IC804	A-8	P4	C-12	R818	B-8
C806	F-5	C836	B-3	D808	A-2	IC806	D-6	P11	C-12	R820	A-2
C807	C-1	C838	B-1	D811	A-7	L801	E-13	Q801	E-1	R824	B-9
C811	B-1	C844	B-1	D812	C-9	L802	F-12	Q802	B-8	R826	E-1
C812	D-3	C847	C-10	D813	C-8	L805	C-9	R801	C-13	R827	B-1
C815	E-4	C848	B-8	D816	B-7	L806	D-3	R803	F-3	R828	B-4
C816	C-1	C849	A-5	D817	A-1	L807	B-6	R804	F-10	R831	B-7
C817	A-7	C856	B-11	D818	C-10	L808	A-7	R805	E-3	RL001	D-10
C818	A-9	C863	C-10	D819	B-8	L809	E-4	R807	D-5	T001	D-12
C820	C-8	D001	C-12	D821	C-9	L812	A-8	R809	B-7	T801	B-5
C821	A-11	D002	D-10	D827	C-10	L820	D-7	R811	D-7	TPP4	A-1

PARTS LIST

SEMICONDUCTORS

(Select replacement for best results.)

Item No.	Type No.	Mfr. Part No.	NTE Part No.	ECG Part No.	TCE Part No.
D001	ERA15-01	-	NTE552	ECG552	SK9000
D002	MA165	-	NTE519	ECG519	SK3100
D005	MA170	-	NTE519	ECG519	SK3100
D009	MA1030M	-	NTE5004A	ECG5004A	SK3A0
D011	SEL1410G	-	-	-	-
	TVSSEL1410G	-	-	-	-
D018	MA4051M	-	NTE5010A	ECG5010A	SK5A1
D030	QA205E	TVSQA205E	NTE5010A	ECG5010A	SK5A1
D031	MA29WBA	-	-	-	-
D032	MA165	-	NTE519	ECG519	SK3100
D101	QA205D	TVSQA205D	NTE5010A	ECG5010A	SK5A1
D301	MA165	-	NTE519	ECG519	SK3100
D303	MA4062L	-	NTE5012A	ECG5012A	SK6A0
D304	MA165	-	NTE519	ECG519	SK3100
D366	MA165	-	NTE519	ECG519	SK3100
D367, 68	MA4075L	-	NTE5015A	ECG5015A	SK7A5
D451	ERA15-01V3	-	NTE552	ECG552	SK9000
	ERA15-01	-	NTE552	ECG552	SK9000
D452	MA4360M	-	-	-	-
D453	MA165	-	NTE519	ECG519	SK3100
D502	MA4082M	-	NTE5016A	ECG5016A	SK8A2
D503	MA4180M	-	NTE5027A	ECG5027A	SK18A
D504	QA208C	TVSQA208C	NTE5016A	ECG5016A	SK8A2
D506	MA4047M	-	NTE5009A	ECG5009A	SK4A7
# **D531**	AS01	-	NTE552	ECG552	SK9000
	AU01	-	NTE552	ECG552	SK9000
	ERA2204	-	NTE552	ECG552	SK9000
# **D532**	QA206M	TVSQA206M	NTE5012A	ECG5012A	SK6A0
# **D551**	AS01	-	NTE552	ECG552	SK9000
	AU01	-	NTE552	ECG552	SK9000
	ERA2204	-	NTE552	ECG552	SK9000
# **D552**	ERD07-15	-	NTE551	ECG551	SK3125A
# **D553**	RU3N	TVSRU3N	NTE580	ECG580	SK5036
# **D554**	AU02	-	NTE552	ECG552	SK9000
	ERA1804	-	NTE552	ECG552	SK9000
D555	MA171	-	NTE519	ECG519	SK3100
D556	MA165	-	NTE519	ECG519	SK3100
D601, 02	MA165	-	NTE519	ECG519	SK3100
D770 Thru					
D774	MA165	-	NTE519	ECG519	SK3100
D775	MA4043M	-	NTE5008A	ECG5008A	SK4A3
# **D801** Thru					
# **D804**	RM10B	TVSRM10B	NTE125	ECG125	SK3081
D805	MA1100M	-	NTE5019T1	ECG5019T1	SK9970
D806	MA150	-	NTE177	ECG177	SK9091
D808	AU02Z	-	NTE552	ECG552	SK9000
# **D811**	RU3AN	TVSRU3AN	NTE552	ECG552	SK9000
# **D812**	RU3YX-M	-	-	-	-
# **D813**	RU3YX-MLF-C4	-	-	-	-

 # For SAFETY use only equivalent replacement part.

SEMICONDUCTORS continued

(Select replacement for best results.)

	Item No.	Type No.	Mfr. Part No.	NTE Part No.	ECG Part No.	TCE Part No.
	D816	SR2KL	TVSSR2KL	-	-	-
#	**D817**	AU02Z	-	NTE552	ECG552	SK9000
	D818, 19	MA165	-	NTE519	ECG519	SK3100
#	**D821**	RU3YX-M	-	-	-	-
	D827	MA4220M	-	-	-	-
	D828	AS01	-	NTE552	ECG552	SK9000
	D834	MA4330M	-	NTE5036A	ECG5036A	SK33A
	D902	MA700	-	NTE584	ECG584	-
	D921	MA700	-	NTE584	ECG584	-
	D951, 52	MA165	-	NTE519	ECG519	SK3100
	D954	MA165	-	NTE519	ECG519	SK3100
	D955	MA29W-B	-	-	-	-
		MA29WBA	-	-	-	-
	D956	MA4056H	-	NTE5011A	ECG5011A	SK5A6
	D960	MA165	-	NTE519	ECG519	SK3100
	D1101 Thru					
	D1105	MA165	-	NTE519	ECG519	SK3100
	D1116, 17	MA165	-	NTE519	ECG519	SK3100
	D1180, 81	MA165	-	NTE519	ECG519	SK3100
	D1191 Thru					
	D1194	MA165	-	NTE519	ECG519	SK3100
	D2203	MA150	-	NTE177	ECG177	SK9091
	D2301	MA4360M	-	-	-	-
	D2302	MA1390H	-	-	-	-
	D2305, 06	MA4033L	-	-	-	-
	D2307	MA165	-	NTE519	ECG519	SK3100
	D2308	MA4360M	-	-	-	-
	D3251, 52	MA700	-	NTE584	ECG584	-
	IC011	MN1872432QAD	-	-	-	-
		MN1872432QAB	-	-	-	-
	IC101	AN5179K	-	-	-	-
#	**IC301**	AN5304NK	-	-	-	-
	IC451	LA7838	-	NTE7039	ECG7039	-
#	**IC801**	STR-S6302	-	-	-	-
#	**IC803**	AN78M09	-	NTE1902	ECG1902	SK3962
#	**IC804**	SE140N	-	-	-	-
#	**IC806**	TLP621GR	-	NTE3098	ECG3098	SK10178
#	**IC844**	AN7812	-	NTE966	ECG966	SK3592
	IC1101	TNQ2682	-	-	-	-
	IC2200	CXA1534S	-	-	-	-
		CXA1124AS	-	-	-	-
	IC2301	TA8200AH	-	NTE7068	ECG7068	-
	IC2303	CXA1279S	-	-	-	-
	IC3001	AN5858K	-	-	-	-
	Q001	2SC1685S	-	NTE85	ECG85	SK9229
		2SC1685RS	-	NTE85	ECG85	SK9229
	Q016	2SA564AQ	-	NTE290A	ECG290A	SK3932
		2SA564AQRS	-	NTE290A	ECG290A	SK3932

 # For SAFETY use only equivalent replacement part.

SEMICONDUCTORS continued

(Select replacement for best results.)

	Item No.	Type No.	Mfr. Part No.	NTE Part No.	ECG Part No.	TCE Part No.
	Q017 Thru					
	Q020	2SC1685R	-	NTE85	ECG85	SK9229
		2SC1685QRS	-	NTE85	ECG85	SK9229
	Q028	2SC1685Q	-	NTE85	ECG85	SK9229
		2SC1685QRS	-	NTE85	ECG85	SK9229
	Q101	2SB709A	-	NTE2409	ECG2409	SK10100
	Q301	2SA564AQ	-	NTE290A	ECG290A	SK3932
		2SA564AQRS	-	NTE290A	ECG290A	SK3932
	Q302	2SC1685R	-	NTE85	ECG85	SK9229
		2SC1685QRS	-	NTE85	ECG85	SK9229
	Q304	2SC1685R	-	NTE85	ECG85	SK9229
		2SC1685QRS	-	NTE85	ECG85	SK9229
	Q305	2SA564AQ	-	NTE290A	ECG290A	SK3932
		2SA564AQRS	-	NTE290A	ECG290A	SK3932
	Q308	2SC1685R	-	NTE85	ECG85	SK9229
		2SC1685QRS	-	NTE85	ECG85	SK9229
	Q351 Thru					
	Q353	2SC3063	-	NTE157	ECG157	SK3747
		2SC3063RL	-	NTE157	ECG157	SK3747
	Q354 Thru					
	Q356	2SC1685Q	-	NTE85	ECG85	SK9229
		2SD637QRS	-	NTE16	ECG16	SK9664
	Q363	2SA564AQ	-	NTE290A	ECG290A	SK3932
		2SB642QRS	-	NTE19	ECG19	SK3912
	Q451	2SC1685R	-	NTE85	ECG85	SK9229
		2SC1685QRS	-	NTE85	ECG85	SK9229
	Q501	2SC4212H	-	-	-	-
#	**Q551**	2SD1556	-	NTE2302	ECG2302	SK9422
		2SD1556MA	-	NTE2302	ECG2302	SK9422
	Q602, 03	2SC1685Q	-	NTE85	ECG85	SK9229
		2SC1685QRS	-	NTE85	ECG85	SK9229
	Q604	2SA564AQ	-	NTE290A	ECG290	SK3932
		2SA564AQRS	-	NTE290A	ECG290A	SK3932
	Q705	2SC1685Q	-	NTE85	ECG85	SK9229
		2SC1685QRS	-	NTE85	ECG85	SK9229
	Q751	2SC1685Q	-	NTE85	ECG85	SK9229
	Q752	2SA564AQ	-	NTE290A	ECG290A	SK3932
		2SA564AQR	-	NTE290A	ECG290A	SK3932
	Q753	2SD1267AP	-	-	-	-
		2SD1267APQ	-	-	-	-
		2SD1267ALBPQ	-	-	-	-
	Q770 Thru					
	Q778	2SD637-R	-	NTE16	ECG16	SK9664
		2SD637QR	-	NTE16	ECG16	SK9664
	Q801	2SB642-Q	-	NTE19	ECG19	SK3912
		2SB642QRS	-	NTE19	ECG19	SK3912
		2SA564AQRS	-	NTE290A	ECG290A	SK3932

 # For SAFETY use only equivalent replacement part.

PARTS LIST continued

SEMICONDUCTORS continued

(Select replacement for best results.)

Item No.	Type No.	Mfr. Part No.	NTE Part No.	ECG Part No.	TCE Part No.
Q802	2SD637-Q	-	NTE16	ECG16	SK9664
	2SD637QRS	-	NTE16	ECG16	SK9664
	2SC1685QRS	-	NTE85	ECG85	SK9229
Q805	2SA879Q	-	NTE288*	ECG288*	SK3434*
Q806	2SC1685R	-	NTE85	ECG85	SK9229
	2SC1685QRS	-	NTE85	ECG85	SK9229
Q901 Thru					
Q904	2SC1685Q	-	NTE85	ECG85	SK9229
	2SC1685QRS	-	NTE85	ECG85	SK9229
	2SD637QRS	-	NTE16	ECG16	SK9664
Q905, 06	2SA564AQ	-	NTE290A	ECG290A	SK3932
	2SA564AQRS	-	NTE290A	ECG290A	SK3932
	2SB642QRS	-	NTE19	ECG19	SK3912
Q909	2SC1685Q	-	NTE85	ECG85	SK9229
	2SC1685QRS	-	NTE85	ECG85	SK9229
	2SD637QRS	-	NTE16	ECG16	SK9664
Q951 Thru					
Q953	2SC1685Q	-	NTE85	ECG85	SK9229
	2SC1685QRS	-	NTE85	ECG85	SK9229
	2SD637QRS	-	NTE16	ECG16	SK9664
Q954	2SA564AQ	-	NTE290A	ECG290A	SK3932
	2SA564AQRS	-	NTE290A	ECG290A	SK3932
	2SB642QRS	-	NTE19	ECG19	SK3912
Q955	2SB940P		NTE398	ECG398	SK9363
	2SB940PLB		NTE398	ECG398	SK9363
	2SB940APLB	-	NTE398	ECG398	SK9363
Q956	2SD1264P	-	NTE375	ECG375	SK9118
	2SD1264-PLB	-	NTE375	ECG375	SK9118
	2SD1264APLB	-	NTE375	ECG375	SK9118
Q1101, 02	2SC1685R	-	NTE85	ECG85	SK9229
	2SC1685QRS	-	NTE85	ECG85	SK9229
Q1180, 81	2SD601A	-	NTE2408	ECG2408	SK10099
	2SD601ATW	-	NTE2408	ECG2408	SK10099
Q1191 Thru					
Q1193	2SD601A	-	NTE2408	ECG2408	SK10099
	2SD601ATW	-	NTE2408	ECG2408	SK10099
Q2203	2SD601A	-	NTE2408	ECG2408	SK10099
	2SD601ATW	-	NTE2408	ECG2408	SK10099
Q2205	2SB709A	-	NTE2409	ECG2409	SK10100
	2SB709ATW	-	NTE2409	ECG2409	SK10100
Q2206	2SD601A	-	NTE2408	ECG2408	SK10099
	2SD601ATW	-	NTE2408	ECG2408	SK10099
Q2301, 02	2SC1685R	-	NTE85	ECG85	SK9229
	2SC1685QRS	-	NTE85	ECG85	SK9229
Q2303, 4	2SA564AQ	-	NTE290A	ECG290A	SK3932
	2SA564AQRS	-	NTE290A	ECG290A	SK3932
Q3001	2SD601A	-	NTE2408	ECG2408	SK10099
	2SD601ATW	-	NTE2408	ECG2408	SK10099

* Lead configuration may vary from original.

SEMICONDUCTORS continued

(Select replacement for best results.)

Item No.	Type No.	Mfr. Part No.	NTE Part No.	ECG Part No.	TCE Part No.
Q3004 Thru					
Q3007	2SD601A	-	NTE2408	ECG2408	SK10099
	2SD601ATW	-	NTE2408	ECG2408	SK10099
Q3017	2SD601A	-	NTE2408	ECG2408	SK10099
	2SD601ATW	-	NTE2408	ECG2408	SK10099
Q3204, 05	2SD601A	-	NTE2408	ECG2408	SK10099
	2SD601ATW	-	NTE2408	ECG2408	SK10099
Q3206	2SB709A	-	NTE2409	ECG2409	SK10100
	2SB709ATW	-	NTE2409	ECG2409	SK10100
Q3208	2SD601A	-	NTE2408	ECG2408	SK10099
	2SD601ATW	-	NTE2408	ECG2408	SK10099
Q3210, 11	2SD601A	-	NTE2408	ECG2408	SK10099
	2SD601ATW	-	NTE2408	ECG2408	SK10099
Q3240, 41	2SC1685R	-	NTE85	ECG85	SK9229
	2SC1685QRS	-	NTE85	ECG85	SK9229
Q3242	2SC1685Q	-	NTE85	ECG85	SK9229
	2SC1685QR	-	NTE85	ECG85	SK9229
Q3251 Thru					
Q3254	2SD601A	-	NTE2408	ECG2408	SK10099
	2SD601ATW	-	NTE2408	ECG2408	SK10099
Q3271	2SD601A	-	NTE2408	ECG2408	SK10099
	2SD601ATW	-	NTE2408	ECG2408	SK10099
Q6501 Thru					
Q6505	2SD601A	-	NTE2408	ECG2408	SK10099
	2SD601ATW	-	NTE2408	ECG2408	SK10099

CABINET PARTS

MODELS CT-F29L1, CT-F29L1 L, CTP-2780SF

Item	Mfr. Part No.
Cabinet Front	TXFKY212SER
Cabinet Rear	TXFKU491SER
Door, Control	TKP2A50711

MODEL PC-29SF80A

Item	Mfr. Part No.
Cabinet Front	TXFKY032SER
Cabinet Rear	TXFKU481SER
Door, Control	TKP2A50711

REMOTE TRANSMITTER EUR50725

Item	Mfr. Part No.
Case Top	UR50VCS823
Case Bottom	UR50CS936B
Battery Cover	UR50EC937

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PARTS LIST continued

CONTROLS & RESISTORS

	Item No.	Function/Rating	Mfr. Part No.	NTE Part No.
#	**D850**	3.2 Cold PTC Thermistor	TRPW5B0M030D	-
	R088	10K 1/4W 1%	ER025CKF1002	-
	R089	10K 1/4W 1%	ER025CKF1002	-
	R094	30.1K 1/4W 1%	ER0S2CKF3012	-
	R115	1000 Detect Out	EVND4AA00B13	-
	R132	5000 RF AGC	EVN64UA00B53	-
	R309	500 Sub Contrast	EVND4AA00B52	-
	R315	10K Reference Gyrator	EVN64UA00B14	-
	R324	20K Sub Bright	EVN64UA00B24	-
	R328	33 1/4W 1%	ER0S2CKF33R0	-
	R329	412 1/4W 1%	ER0S2CKF4120	-
	R330	1050 1/4W 1%	ER0S2CKF1051	-
	R354	5000 Red Low Light	EVN65UA00B53	-
	R355	5000 Blue Low Light	EVN65UA00B53	-
	R356	5000 Green Low Light	EVN65UA00B53	-
	R360	2000 Red Drive	EVN65UA00B23	-
	R361	2000 Blue Drive	EVN65UA00B23	-
#	**R392**	560 1/2W 5%	ERDS1TJ561	HW156
	R461	30K Vertical Size	EVN64UA00B34	-
	R502	200 Horizontal Center	EVN64UA00B22	-
#	**R515**	2700 3W 5%	ERG3SJS272	3W227
#	**R516**	2700 3W 5%	ERG3SJS272	3W227
#	**R531**	47 1/4W 5%	ERD25FJ470	QW047
#	**R532**	24.3K 1/4W 1%	ER0S2CKF2432	-
#	**R533**	7150 1/4W 1%	ER0S2CKF7151	-
#	**R534**	680 1/4W 5%	ERDS2TJ681	QW168
#	**R535**	820 1/4W 5%	ERDS2TJ821	QW182
#	**R553**	2.2 5W 10%	ERF5ZK2R2	-
#	**R557**	2700 2W 5%	ERG2CJP272	2W227
#	**R558**	1000 1W 5% Fusible	ERQ1CJP102	F1W210
#	**R559**	1 1/2W 5%	ERDS1FJ1R0	HW1D0
	R610	50K Sub Color	EVND4AA00B54	-
	R614	50K Sub Tint	EVND4AA00B54	-
	R712	50K Keystone	EVN64AA00B54	-
	R756	10K E-W PCC	EVN64UA00B14	-
	R757	Horizontal Width	EVN64UA00B53	-
	R764	1 2W 5% Fusible	ERQ2CJP100	2W1D0
	R790	150 1/4W 5% Fusible	ERQ14AJ151	-
#	**R801**	.68 7W 10% Wirewound	-	10WD68
		.47 5W 5% Wirewound	ERF5AKR47	10WD47
#	**R804**	100 5W 5%	ERG5SJ101	-
#	**R805**	47 2W 5%	ERG2ANJ470	2W047
	R809	140K 1/4W 1%	EROS2CKF1403	-
#	**R811**	.33 1W 10% Fusible	ERQ1CKR33	-
#	**R812**	12 5W 5% Wirewound	ERF5ZJ120	5W012
#	**R813**	2.7M 1/2W 20%	ERC12ZGM275	HW527
	R814	10K 1/4W 1%	ER025CKF1002	-

 # For SAFETY use only equivalent replacement part.

CONTROLS & RESISTORS continued

	Item No.	Function/Rating	Mfr. Part No.	NTE Part No.
#	**R823**	33 3W 5% Fusible	ERG3ANJ330	-
#	**R828**	3.9 3W 5% Fusible	ERQ3CJ3R9	-
	R830	9100 3W 5%	ERG3ANJ912	3W291
#	**R833**	10 2W 5% Fusible	ERQ2CJ100	F2W010
	R960	10 1/4W 5% Fusible	ERQ14AJ100	-
	R961	330 1W 5% Fusible	ERQ1CJP331	F1W133
	R1189	21K 1/4W 1%	ER025CKF2102	-
	R2200	10K Input Level	EVND4AA00B14	-
	R2209	10K L-R Level	EVND4AA00B14	-
	R2210	43K 1/10W 1%	ERJ6ENF4302	-
	R2213	5000 Separation	EVND4AA00B53	-
	R2220	50K VCO	EVND4AA00B54	-
	R2221	20K Filter	EVND4AA00B24	-
	R2222	44.2K 1/10W 1%	ERJ6ENF4422	-
	R2238	47K 1/10W 1%	ERJ6ENF4702	-
	R6512	200 Reference	EVND4AA00B22	-

 # For SAFETY use only equivalent replacement part.

CAPACITORS & ELECTROLYTICS

	Item No.	Rating	Mfr. Part No.
	C020	33pF NPO 50V 5%	ECCF1H330JC
	C021	33pF NPO 50V 5%	ECCF1H330JC
	C058	30pF Trimmer	ECRHA030E81
	C118	2pF 50V ± .25pF	ECUX1H020CCN
	C304	33µf 10V NP	ECEA1AN330S
	C351	.001 2KV 10%	ECKD3D102KB
	C352	1µf 50V NP	ECEA1HN010S
	C451	1µf 25V Tantalum	ECSF1EE105VE
	C508	220pF N750 50V 5%	ECCF1H221JU
#	**C531**	33µf 35V	ECEA1VU330
#	**C551**	.01 1.2KV 5%	ECWH12H103JS
#	**C552**	.033 400V 5%	ECQM4333JZ
#	**C554**	820pF 2KV 5%	ECKD3D821JB
#	**C555**	.0047 1.2KV 5%	ECWH12H472JS
#	**C556**	560pF 2KV 5%	ECKD3D561JB
#	**C557** (1)	100pF 2KV 5%	ECKD3D101JB
		270pF 2KV 5%	ECKD3D271JB
		470pF 2KV 5%	ECKD3D471JB
		560pF 2KV 5%	ECKD3D561JB
		680pF 2KV 5%	ECKD3D681JB
		820pF 2KV 5%	ECKD3D821JB
#	**C558**	820pF 2KV 5%	ECKD3D821JB
#	**C559**	.43 200V 5%	ECQF2H434JS
#	**C560**	.033 50V 5%	ECQB1H333JF
#	**C562**	470µf 35V	ECEA1VU471
#	**C563**	4.7µf 160V	ECEA2CU4R7
#	**C564**	22µf 250V	ECEA2EU220
#	**C567**	470pF 2KV 5%	ECKD3D471JB
#	**C569**	33µf 160V	ECEA160V33Z
	C603	7pF N750 50V ± .5pF	ECCF1H070DU
	C615	15pF NPO 50V 5%	ECCF1H150JC
	C770	10µf 16V NP	ECEA1CN100S
	C771	3.3µf 50V NP	ECEA1HN3R3S
	C772	3.3µf 50V NP	ECEA1HN3R3S
	C776	10µf 16V NP	ECEA1CN100S
#	**C801**	.0047 500V +100% -0%	ECKD2H472PU
#	**C802**	.0047 500V +100% -0%	ECKD2H472PU
#	**C803**	.0047 500V +100% -0%	ECKD2H472PU
#	**C805**	.22 125VAC 10%	ECQU1A224KH
#	**C806**	470µf 200V	ECES2DG471N4
#	**C818**	220µf 160V	ECES2CG221E4
#	**C821**	1000µf 25V	ECEA1EU102
#	**C826**	4700µf 25V	ECEA1EU472
#	**C828**	.018 250VAC 20%	ECQU2A183MN
#	**C829**	.018 250VAC 20%	ECQU2A183MN
#	**C831**	330µf 16V	ECEA1CFS331
	C835	470pF 2KV 10%	ECKD3D471KB
#	**C843**	47µf 25V	ECEA1EFS470
#	**C849**	.018 200V 10%	ECQM2183KZ
#	**C851**	1000µf 16V	ECEA1CU102

 # For SAFETY use only equivalent replacement part.
(1) Replace with original value.

CAPACITORS & ELECTROLYTICS continued

Item No.	Rating	Mfr. Part No.
C901	10µf 16V NP	ECEA1CN100S
C955	10pF 50V ± .25pF	ECCF1H100C
C2201	10µf 16V NP	ECEA1CN100S
C2204	.22µf 50V NP	ECE1HNR22S
C2208	4.7µf 25V NP	ECEA1EU4R7
C2209	10µf 16V Tantalum	ECSZ16EF10
C2211	3.3µf 16V Tantalum	ECSZ16EF3R3
C2212	4.7µf 25V NP	ECEA1EN4R7S
C2322	1µf 50V NP	ECEA1HN010S
C2323	1µf 50V NP	ECEA1HN010S
C3001	22µf 16V NP	ECEA1CN220S
C3018	22µf 16V NP	ECEA1CN220S
C3202	10pF 50V ± .5pF	ECUX1H100DCN
C3203	10pF 50V ± .5pF	ECUX1H100DCN
C3204	100pF NPO 50V 5%	ECCF1H101JC
C3256	10µf 16V NP	ECEA1CN100S
C6501	47uF 10V NP	ECEA1AN470S

PARTS LIST continued

COILS & TRANSFORMERS

Item No.	Function/Rating	Mfr. Part No.	On-Unit No.
L011	100µh	ELEPH101KA	-
L013	5.6µh	TLUABTA5R6K	-
L014	5.6µh	TLUABTA5R6K	-
L015	5.6µh	TLUABTA5R6K	-
L016	5.6µh	TLUABTA5R6K	-
L017	5.6µh	TLUABTA5R6K	-
L019	5.6µh	TLUABTA5R6K	-
L021	5.6µh	TLUABTA5R6K	-
L022	Ferrite Bead	EXCELSA35	-
L023	5.6µh	TLUABTA5R6K	-
L024	5.6µh	TLUABTA5R6K	-
L025	5.6µh	TLUABTA5R6K	-
L026	5.6µh	TLUABTA5R6K	-
L030	Ferrite Bead	EXCELSA35	-
L103	15µh	ELEPH150KA	-
L104	.56µh	TLQR56N205C	-
L105	VCO	EIV7EN068B	-
L108	33µh	ELEPH330JA	-
L152	AFC	EIV7EN041B	-
L201	Quadrature	EIS7ES004B	-
L202	2.2uF	TLQ022K205C	-
L351	Ferrite Bead	EXCELSA35	-
L451	12µh	TLQ120K236	-
L452	Power	ELC08D067	-
# **L551**	Linearity	TLH6618P	-
L553	Ferrite Bead	EXCELSA24	-
L554	Ferrite Bead	EXCELSA35	-
# **L555**	Yoke 110° Horiz 1.15µh Vert 22.9µh	OLY15901F	-
# **L556**	Ferrite Bead	EXCELSA35	-
L602	82µh	TLUABTA820K	-
# **L751**	Pincushion	TLH157SSM	-
L770	Top and Bottom PCC	ELH11Y751	-
# **L801**	AC Line Choke	ELF18D656Y	-
# **L802**	AC Line Choke	ELF18D656Y	-
L805	Ferrite Bead	EXCELSA35	-
L806	Ferrite Bead	EXCELSA35	-
L807	Ferrite Bead	EXCELSA35	-
# **L808**	Ferrite Bead	EXCELSA35	-
L809	Ferrite Bead	TSK1014	-
L812	Power Supply Filter	ELC10B011	-
# **L814**	Degaussing Coil	OLK19034A	-
# **L821**	Ferrite Bead	TSC910	-
# **L822**	Ferrite Bead	TSC910	-
L901	33µh	ELEPH330KA	-
L951	15µh	ELEPH150KA	-
L952	Ferrite Bead	EXCELSA35	-
L953	Ferrite Bead	EXCELSA39	-
L954	Ferrite Bead	EXCELSA39	-
L955	Ferrite Bead	EXCELSA39	-
L956	Ferrite Bead	EXCELSA35	-

 # For SAFETY use only equivalent replacement part.

COILS & TRANSFORMERS continued

Item No.	Function/Rating	Mfr. Part No.	On-Unit No.
L957	Ferrite Bead	EXCELSA35	-
L958	Ferrite Bead	EXCELSA35	-
L959	Ferrite Bead	EXCELSA35	-
L960	Ferrite Bead	EXCELSA35	-
L1103	5.6µh	TLUABTA5R6K	-
L1106	5.6µh	TLUABTA5R6K	-
L1107	5.6µh	TLUABTA5R6K	-
L3202	82µh	ELEPH820JA	-
L3204	27µh	ELEPH270KA	-
L3207	39µh	ELEPH390JA	-
# **T001**	Power Supply	TLP16297	-
# **T501**	Horizontal Driver	ETH19Y70AY	-
# **T551** (1)	Flyback	0LF04507F	-
T771	Top and Bottom PCC	ETR26L32A	-
# **T801**	Power	ETS39K419V	-

 # For SAFETY use only equivalent replacement part.
(1) Screen and focus controls are part of T551.

PARTS LIST continued

MISCELLANEOUS

	Item No.	Description	Mfr. Part No.	Notes
#	**F001**	Fuse	0BA1F40NU100	4A, 125V
	JK3001	Jack	TJB17688	A/V Input 1&2, S Video 1, A/V Program Out, VAO Out
	L3271	Delay Line	EIL1EG025Q	-
	L6501	Delay Line	EFDEN645B35B	-
	L6502	Delay Line	EIK1EG024B	-
#	**N801**	Neon Lamp	XANT343	-
#	**P1**	AC Cord	TSX1422	-
#	**R831**	Fuse	TSF19402-1	4A, 60VDC, 90VAC
#	**RL001**	Power Relay	TSE1864	-
	S010	Switch	EVQQVC13T	Power
	S011	Switch	EVQQVC13T	Volume Down
	S012	Switch	EVQQVC13T	Volume Up
	S013	Switch	EVQQVC13T	Channel Down
	S014	Switch	EVQQVC13T	Channel Up
	S015	Switch	EVQQVC13T	Display
	S016	Switch	EVQQVC13T	Menu
	S017	Switch	EVQQVC13T	Recall/Advance
	S018	Switch	EVQQVC13T	TV/Video
	S020	Switch	EVQQVC13T	Normal
	S021	Switch	EVQQVC13T	Video Function
	S2301	Switch	ESD1512250	Speaker
	SP1, SP2	Speakers	EAS12D533K-G	3" x 5", 8 Ohm, 2W
#	**V1**	CRT	M68KTY161X	-
	X011	Resonator	TAF10020	-
	X012	Crystal	TSS1013-D	32.7KHz
	X101	Filter	EFCH45MGP2N	SAW
	X102	Trap	EFCS4R5MW3BA	4.5MHz
	X201	Filter	EFCS4R5MS4W	4.5MHz Bandpass
	X501	Crystal	TAFCSB503F38	Clock
	X601	Crystal	TSS816MX	3.58MHz
		Board (1)	TNP1901126LZ	A
			TNP190126RZ	Model PC-29SF80A
		Board (1)	TNP110330	C
		Board (1)	TNP110544AZ	H
		Board (1)	TNP110337	K
		Board (1)	TNP110338	L
		Board (1)	TNP110333DZ	N
		Board (1)	TNP110327DB	P
		Board (1)	TNP110734	X
		Board (1)	TNP110339BZ	Z
		Convergence	0FMK014ZZ	Corrector Strip
		Convergence	ETC-35C6NA	Yoke
		Fuse Holder	TJC6319	-
		Receiver	TNQ2682A	Remote
		Socket	TJS1A5210	CRT
		Terminal	TXAMWTRXMR	Antenna
		Transmitter	EUR50725	Remote
#		UHF/VHF Tuner (1)	ENV568F7G3	-
			ENV568F8G3	Used in model PC-29SF80A
		Wedge	TMM2A30201	Yoke

 # For SAFETY use only equivalent replacement part.
(1) Contact PTS Electronics Corporation for replacement; order by manufacturer's part number.

Important Parts Information

- The parts listed here are those not usually available from a well-stocked supply cabinet or bin.
- Where items may be replaced with equivalent parts, several alternates are shown from participating vendors.
- On the parts lists, safety items are marked with a # to remind you that only exact replacements are recommended for these items.
- When ordering parts, state the model number, part number, and description.

Obtaining Parts

Many of these parts are available from your local Sams authorized distributor or the manufacturer of the equipment. Call Sams for the name of your nearest distributor:

800-428-7267

Or consult the Sams *Annual Index* for the address of the original equipment manufacturer.

Participating Vendors

Information on test equipment and replacement parts is listed in these pages for the following participating vendors. Consult the Sams *Annual Index* for their current address.

- Custom Components Corporation (Chek-A-Color)
- NTE Electronics, Inc. (NTE)
- Philips ECG Company (ECG)
- PTS Electronics Corporation (PTS)
- Sencore, Inc.
- Thomson Consumer Electronics, Inc. (SK, TCE)